LOOPER

LEARNING LOOPS IN THE PUBLIC REALM

WP2. Data collection and visualization framework
T2.2. Set-up of the LOOPER database

Deliverable D 2.1

REPORT ON DATA COLLECTION PROCEDURE FRAMEWORK

ANNEX 2: OPENOISE APP USER GUIDE

Version: 1
Date: 31 March 2018

Responsible partner: IUAV
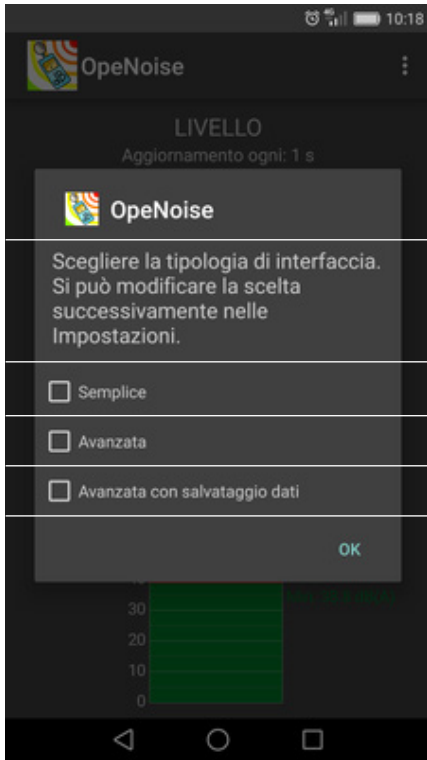**Authors:** Chiara Scanagatta (IUAV), Paolo Ruggeri (IUAV), Massimiliano Condotta (IUAV)

To use the OpeNoise app you have to download it from the Google Play store.

Once you downloaded it, you will find this icon on your smartphone, to start the app click on the icon.

NOTA BENE: before starting the app you have to change some battery settings of the smartphones. You can find these informations at the end of the user guide as you only have to do it once.

|	
	Choose the interface option.
Scegliere la tipologia di interfaccia. Si può modificare la scelta successivamente nelle Impostazioni.	*It is possible to change the choice later in the Settings.*
Semplice	*Simple*
Avanzata	*Advanced*
Avanzata con salvataggio dati	*Advanced with data saving*

At the first opening of the OpeNoise app you will be asked which tipe on interface you want to use.

Please select "Advanced with data saving" and press "OK".

NOTA BENE: it is possible to change this option later on within the settings.
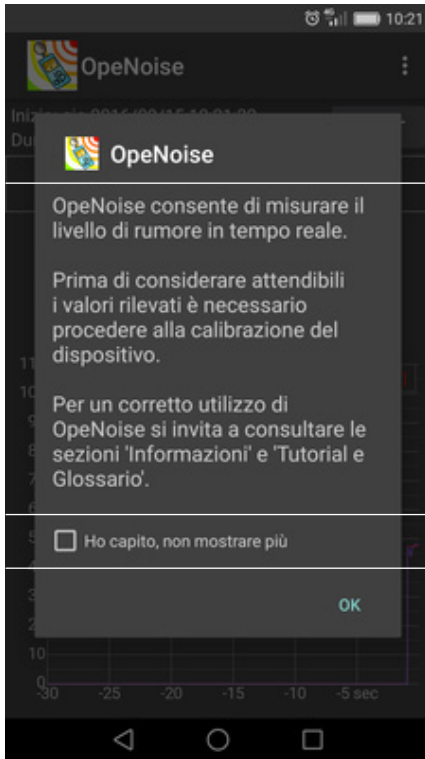
OpeNoise allows you to measure the sound level in real time.

Before considering reliable the data that have been registered it is necessary to calibrate the device.

For a correct use of the OpeNoise app please read the "Information" and "Tutorial and Glossary" sections.

I understood, do not show anymore

After pressing "OK" in the previous page this pop-up will open.

Select "I understood, do not show anymore" and press "OK".

🖼 ▲ ⚠ ⋯ ∗ ⚟ 🕐 ⊿ 80% 🔋 16:17	
OpeNoise ⋮	*Menu (three dots)*
Inizio: Sab 2018/03/31 16:16:40 Durata (t): 0 giorni 00:01:49 **RESET**	*Reset*
LAMin 29.3 — LAeq(t) 65.7 — LAMax 93.8	*Min dB level Equivalent dB level Max dB level*
LAeq (1 s) **59.1** dB(A)	*Real time equivalent dB level*
Non stai salvando dati Salverai i dati ogni: 1 s **SALVA**	*Save (on the right)* *You are not saving data (top left)* *You will save data every 1 sec (bottom left)*

Once you have choosen the interface and accepted the information box you will be able to see the "Home page" of the app.

Here you will be able to see various data: the LAMin (minimum level) of dB(A) since the last "Reset"; the LAeq(t) (equivalent level) of dB(A) since the last "Reset"; the LAMax (maximum level) of dB(A) since the last "Reset"; the real time LAeq (equivalent level) of dB(A) that the app is measuring; the graph of the trend of LAeq in real time.

Here there also are three buttons. On top right there is the "Menu" button (from step 6), under the "Menu" there is the "Reset" button and on half right of the screen there is the "Save" button.
The "Reset" button can be used to reset the graph on the bottom of the screen, on the left of the "Reset" you will see the start of the measurement (since the last reset) on the top row and the running time on the bottom row.

Inizio: Sab 2018/03/31 16:17:35 Durata (t): 0 giorni 00:02:22	**RESET**	
LAMin 29.3	LAeq(t) 65.5	LAMax 93.8

LAeq (1 s) **38.4** dB(A)

Inizio: Sab 2018/03/31 16:17:41 Durata: 0 giorni 00:00:04 (1 s)	**STOP**	

Stop (on the right)
Start: day YYYY/MM/DD hour:min:sec (top left)
Lenght: days hours:mins:secs (every) (bottom left)

To start to collect data you will have to click the "Save" button. As soon as the device starts to collect data the "Save" button will turn into a "Stop" button.

Once you start to collect data you will see (on the left of the "Stop" button):
- Start: day YYYY/MM/DD hour:minute:second of start
- Lenght: days hours:minutes:seconds (every how many sec/min) since the start

To keep collecting the data the app needs to be switched on.

If you want to stop collecting data you need to press the "Stop" button, after doing this you will see again the "Start" button instead of the "Stop" button.

NOTA BENE: if you DO NOT SEE the "Stop" button it means you are NOT COLLECTING DATA. Please always check twice.

🖵 🖼 ✉ ...	✴ ◣ ⏰ ⁴ᴳ 📶 80% ∎ 16:17	
OpeNoise	Informazioni	*Information*
Inizio: Sab 2018/03/31 Durata (t): 0 giorni 00:0	Impostazioni	*Settings*
LAMin 29.3	Dati salvati	*Saved Data*
LAeq 5 (1 s)	Tutorial e Glossario	*Tutorial and Glossary*
	Credits	*Credits*
Inizio: Sab 2018/03/31 Durata: 0 giorni 00:00:14 (1 s)	Esci	*Exit*

LAeq(t) LAeq(1 s)

```
110
100
 90
 80
 70
 60
 50
 40
 30
 20
 10
  0
   -30   -25   -20   -15   -10   -5 sec
```
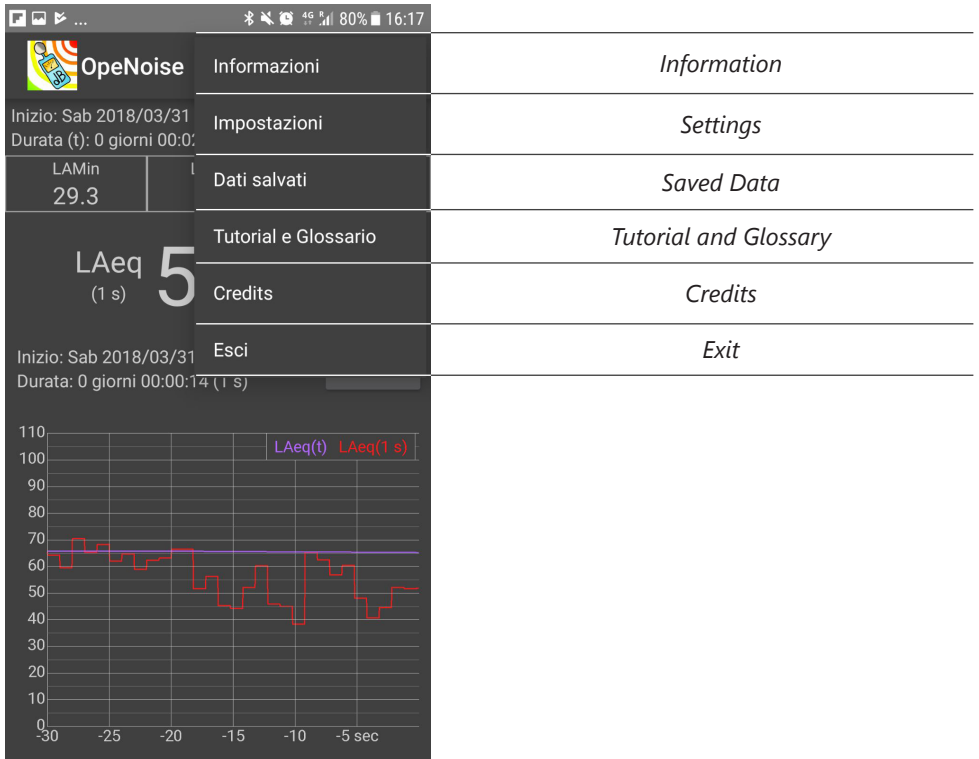
If you press the "Menu" button a list of options will be shown in the top right part of the screen:
- Information
-Settings
- Saved Data
- Tutorial and Glossary
- Credits
- Exit

Here we will see only the "Saved Data" option and the "Settings" option as these are the most important ones to use the OpeNoise app.

"TUTORIAL AND GLOSSARY" OPTION

TUTORIAL	*Tutorial*
ESEGUIRE UNA MISURA La misura del rumore inizia automaticamente con l'apertura di OpeNoise. La misura si interrompe selezionando 'Esci' nel menù principale oppure digitando il pulsante 'Indietro' del dispositivo (digitando il pulsante 'Home' la misura continua in background). Premendo 'RESET' si azzerano tutti i livelli e si inizia una nuova misura.	*How to measure* *Measurement of noise starts automatically with the opening of the OpeNoise app. Measurement interrupts selecting "Esci" from main menu of clicking the "Go Back" button of the device (if you click the "Home" button the measurement will continue in background). If you click the "Reset" button all levels will be reset at zero and you will start with a new measure.*
CALIBRARE IL DISPOSITIVO Ogni dispositivo risponde in maniera diversa ai segnali acustici, per cui è necessario effettuare una calibrazione. Per calibrare il dispositivo occorre verificare il livello sonoro misurato con un valore noto, possibilmente con un fonometro professionale. A partire dal confronto si deve inserire, nelle Impostazioni, il numero di decibel da aggiungere o sottrarre (digitando un numero positivo o negativo, ad esempio '8.9' o '-8.9') in modo che i due valori siano uguali. La calibrazione potrebbe essere reimpostata al valore iniziale di 0 dB dopo l'aggiornamento della app.	*Calibration of the device* *Every device responds in a different way to acoustic signals, this is why a calibration is needed.* *To calibrate the device you need to check the sound level, measured with a known value, possibly with a professional sound level meter. Starting with the confrontation you have to insert, in "Settings", the number of decibel to add or subtract (digiting a positive or negative value, i.e. "8.9" or "-8.9") so that the two values are equal.* *If you update the app the calibration can return to "0.0".*
VERIFICARE LA DINAMICA Seppur calibrati, i dispositivi non sono in grado di misurare correttamente al di sopra di un valore massimo e al di sotto di un valore minimo. Verificare la dinamica significa individuare questi valori. Dopo aver effettuato la calibrazione bisogna dunque cercare il livello massimo e il livello minimo misurabili, possibilmente attraverso un confronto con un fonometro professionale. Al di fuori di tali soglie le misurazioni non sono attendibili.	*Check the dynamics* *Even if calibrated, devices are not able to correctly measure over a maximum value and under a minimum value. Checking the dynamic means to identify these values. After doing the calibration it is needed to serch the max and min levels which can be measured, possibly using a confrontation with a professional sound level meter. Values outside the min-max range are not reliable.*

SALVARE I DATI
L'opzione viene attivata selezionando in Impostazioni la configurazione di interfaccia 'Avanzata con salvataggio dati'. Viene così visualizzato il pulsante 'SALVA' che consente di salvare un file di testo con i dati misurati (non viene registrato l'audio). I file vengono salvati nella cartella 'openoise' della memoria locale (non nella SD esterna) e possono essere aperti nella sezione 'Dati salvati' o con un'altra app.

Data saving
This option can be enabled by selecting in the "Setting" menu the "Advanced with data saving" interface. Doing so the "Save" button is visualized and it allows to save a .txt file with measured data (audio is not registered). Files are saved in the "openoise" folder in the device local memory (NOT in the esternal SD) and can be opened in the "Saved Data" section or with other apps.

GRAFICI
Nella configurazione di interfaccia 'Semplice' è visualizzato un solo grafico con rappresentati i livelli minimo, istantaneo e massimo. Nella configurazione di interfaccia 'Avanzata' sono visualizzati 3 grafici nel seguente ordine:
- Andamento temporale dei livelli globali
- Spettro delle frequenze in terzi di ottava e livelli globali
- Spettro delle frequenze in banda costante calcolato con FFT
Toccando sul grafico si passa al successivo.

Graphs
In the "Simple" interface configuration it is only visualized only one graph which represents minimum, real time and maximum levels. In the "Advanced" interface configuration there are 3 graphs visualized in this order:
- Time courses of global levels
- Frequency spectrum in one-third-octave and global levels
- Frequency spectrum in constant bandwidth calculated with FFT
touching the graph to pass to the next one.

GLOSSARIO	Glossary
dB E' il parametro di misura del livello sonoro.	*dB* *Is the parameter of measure of sound level*
dB(A) E' il parametro di misura del livello sonoro ponderato in frequenza secondo la risposta dell'orecchio umano (ponderazione A).	*dB(A)* *Is the parameter of measure of sound level weighted in frequency according to the answer of human ear (A ponderation)*
LMin E' il livello sonoro minimo rilevato dall'inizio della misura, espresso in dB.	*LMin* *Is the minimum sound level detected since the beginning of the measure, expressed in dB*
LAMin E' il livello sonoro minimo rilevato dall'inizio della misura, espresso in dB(A).	*LAMin* *Is the minimum sound level detected since the beginning of the measure, expressed in dB(A)*
LMax E' il livello sonoro massimo rilevato dall'inizio della misura, espresso in dB.	*LMax* *Is the maximum sound level detected since the beginning of the measure, expressed in dB*
Leq(0.5-1-2 s) E' il livello sonoro equivalente dell'ultimo intervallo di tempo impostato (0.5, 1 o 2 secondi), espresso in dB.	*Leq(0.5-1-2 s)* *Is the equivalent sound level of the last range of time setted (0.5, 1 or 2 seconds), expressed in dB*
LAeq(0.5-1-2 s) E' il livello sonoro equivalente dell'ultimo intervallo di tempo impostato (0.5, 1 o 2 secondi), espresso in dB(A).	*LAeq(0.5-1-2 s)* *Is the equivalent sound level of the last range of time setted (0.5, 1 or 2 seconds), expressed in dB(A)*
Leq(t) E' il livello sonoro equivalente rilevato dall'inizio della misura, espresso in dB.	*Leq(t)* *Is the equivalent sound level detected since the beginning of the measure, expressed in dB*
LAeq(t) E' il livello sonoro equivalente rilevato dall'inizio della misura, espresso in dB(A).	*LAeq(t)* *Is the equivalent sound level detected since the beginning of the measure, expressed in dB(A)*
LIVELLO GLOBALE Livello sonoro calcolato tenendo conto di tutte le frequenze dello spettro.	*Global level* *Is the sound level calculated taking into account of all the frequencies of the spectrum*
SPETTRO Distribuzione in frequenza del livello sonoro.	*Spectrum* *Distribution along frequencies of the sound level*

TERZI DI OTTAVA Rappresentazione dello spettro delle frequenze con una larghezza di banda percentuale costante. I dati rappresentati sono espressi in dB.	*One-third-octave* *Is the representation of the frequency spectrum with a costant percentage of bandwidth. Represented data are expressed in dB*
FFT La FFT (Fast Fourier Transform - Trasformata veloce di Fourier) è una tecnica per calcolare lo spettro delle frequenze con una larghezza di banda costante. Nel caso di OpeNoise le bande sono distanziate ogni 25 Hz. I dati rappresentati sono espressi in dB e dB(A).	*FFT* *The FFT (Fast Fourier Transform) is a technique used to calculate the frequency spectrum with a costant bandwidth. In the case of OpeNoise bands are spaced every 25 Hz. Represented data are expressed in dB and dB(A)*

"SETTINGS" OPTION

← **Impostazioni**	*Settings*
VISUALIZZAZIONE	*Visualization*
Tipologia interfaccia Avanzata con salvataggio dati	*Type of interface* *Advanced with data saving*
Colore interfaccia Scuro	*Colour of interface* *Dark*
Orientamento Normale	*Orientation* *Normal*
Icona nella barra delle notifiche Sì	*Icon in the notification bar* *Yes*
Visualizzazione grafico Sì	*Graph visualization* *Yes*
FONOMETRO	*Sound level meter*
Calibrazione 0.0 dB	*Calibration* *0.0 dB*
Tempo di aggiornamento del livello 1 sec	*Time of sound level updating* *1 sec*
Salvare lo spettro No	*Save the spectrum* *No*

In the "Setting" menu the only options that should be changed are the "Calibration" and the "Time of sound level updating".

For the "Calibration" if you use a WIKO JERRY smatphone you can set it to -11.5 dB, but if you use other smartphones you have to calibrate it with a known sound source.

NOTA BENE: it is necessary to use an external microphone (as explained in the assembly instructions) because modern smartphones have a noise reduction software which can alter data collected.

Tempo di salvataggio su file

- ◉ 1 sec
- ○ 2 sec
- ○ 5 sec
- ○ 30 sec
- ○ 1 min
- ○ 2 min
- ○ 5 min
- ○ 10 min
- ○ 60 min

ANNULLA
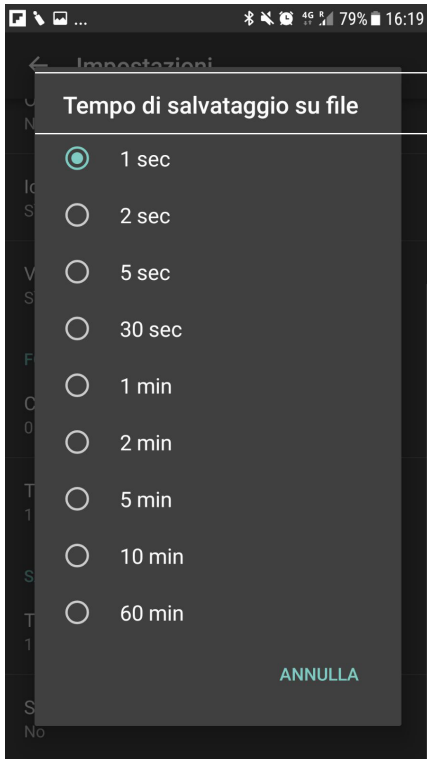
Saving time on document

If you choose the "Time of sound level updating" option a list of possibilities will open up.

The range of possible savings will be between 1 second to 60 minutes, this means that you can choose to collec data every second and up to every 60 minutes.

NOTA BENE: please choose 10 minutes as range, in this way we will have comparable collected data.

"SAVED DATA" OPTION

← **Elenco dei file**	*List of documents*
2018.03.31-16.17.41.OpeNoise.txt	*Example of document with collected data*
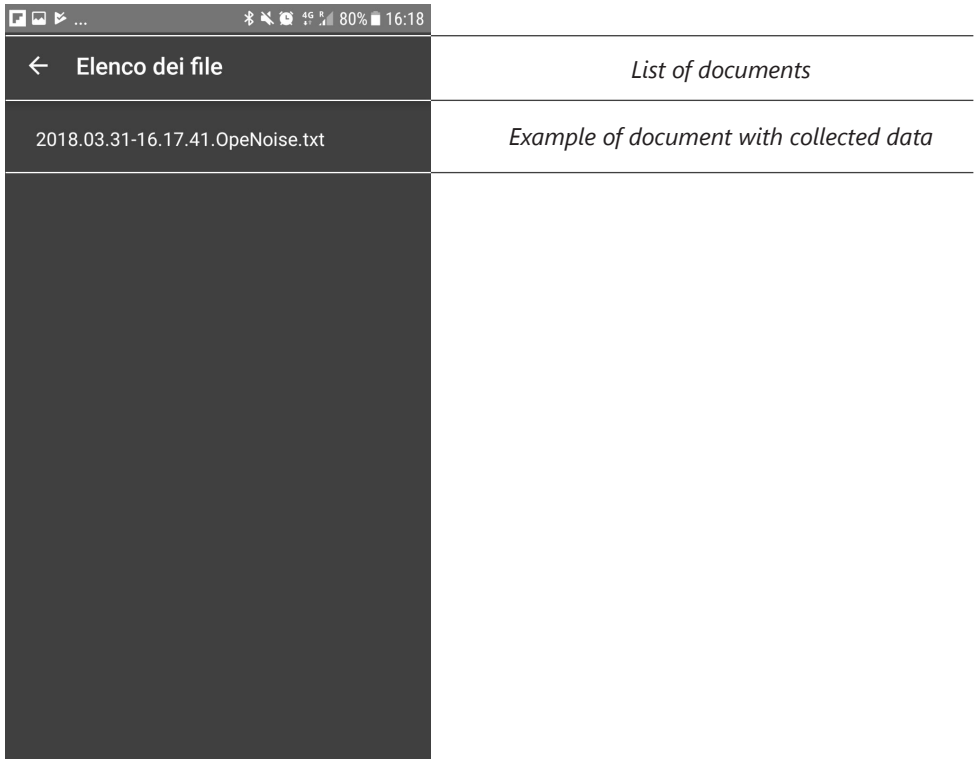
If you press the "Saved Data" option from the "Menu" button in the Home page you will see a text of .txt documents as in the above image.

The document name will be composed by the date (YYYY.MM.DD) and the time in which the measurement started (Hour.Minute.Second) plus the ".OpeNoise" text
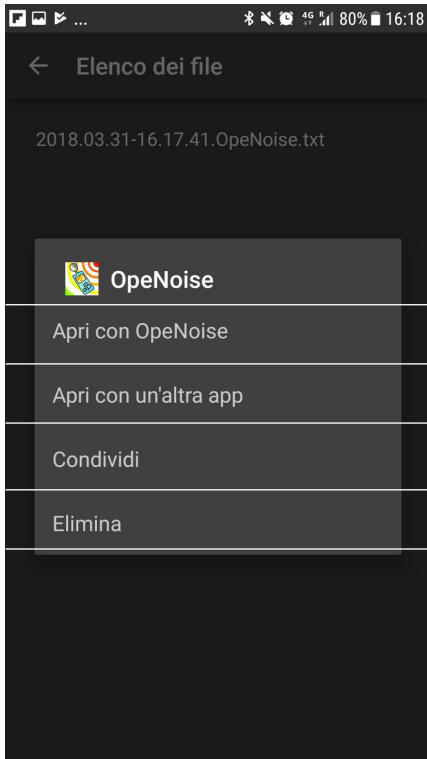
Apri con OpeNoise	*Open with OpeNoise*
Apri con un'altra app	*Open with another app*
Condividi	*Share*
Elimina	*Delete*

Once you click on the file that you want to save, you will be asked if you want to: open it with OpeNoise; open it with another app; share it; delete it.

To save and export it you have to select the "Share" option.
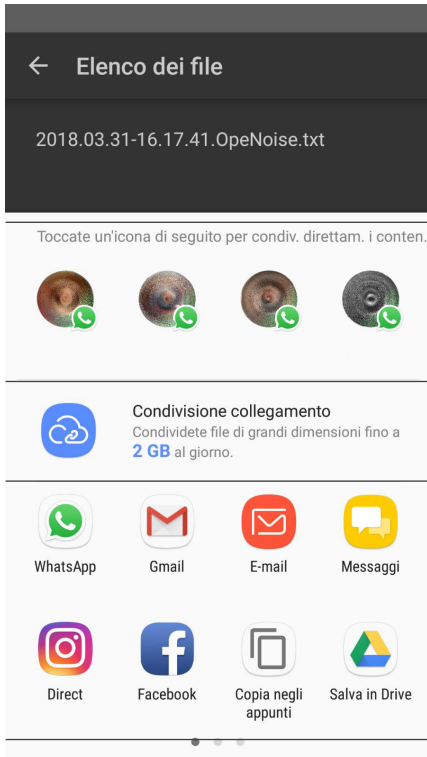
Elenco dei file	
2018.03.31-16.17.41.OpeNoise.txt	
Toccate un'icona di seguito per condiv. direttam. i conten..	*Share via WhatsApp using a frequently used contact*
Condivisione collegamento — Condividete file di grandi dimensioni fino a **2 GB** al giorno.	*Share via cloud system*
WhatsApp Gmail E-mail Messaggi Direct Facebook Copia negli appunti Salva in Drive	*Share using one of the mentioned apps*

As you press the "Share" button this screen will pop up.

From here you can choose how to share the selected file. As you need to have the file saved on your laptop please select "Gmail" or "E-mail", this has to be selected depending on the e-mail account that you have on your smartphone.

After selecting your preferred e-mail you will see the usual screen of an e-mail. At this point you can send the file as attachement to the e-mail.

"SMARTPHONE SETTINGS" OPTION

Settings

Smartphones have some predefined settings that needs to be changed in order to make the OpeNoise application work at its finest.

To change the smartphone, or tablet, settings you need to choose the "Settings" option (in the image abothe is the one in the red circle) from the main screen as you switch the smartphone, or tablet, on.

Impostazioni 🔍	*Settings*
Wireless e reti	*Wireless and networks*
Wi-Fi	*Wi-Fi*
Bluetooth	*Bluetooth*
Schede SIM	*SIM cards*
Utilizzo dati	*Data usage*
Altro	*Other*
Dispositivo	*Device*
Display	*Display*
Audio e notifiche	*Sound and notifications*
App	*App*
Archiviazione e USB	*Storage and USB*
Batteria	*Battery*
Memoria	*Memory*

App	*App*
Tutte le app	*All the app*
360 CLONE	*360 CLONE (app name)*
2,03 MB — Disattivato	*2,03 MB — Disabled*
360 Security	*360 Security (app name)*
7,13 MB	*7,13 MB*
Aggiornamento sistema	*System update*
108 KB	*108 KB*
Apps	*Apps (app name)*
2,01 MB	*2,01 MB*
Assistenza telefono	*Phone assistance (app name)*
12,33 MB	*12,33 MB*

Once you open the "Settings" option it is possible to see there are multiple options. You will need to scroll down and choose "App" from the "Device" group of settings (previous page).

As you open the "App" settings you will see a list with all the apps which are on the device. Here you will need to open the settings of the "App" page.

To do so you have to click on the "Gear symbol" on the top right part of the screen (on the right looking at the "App" text).
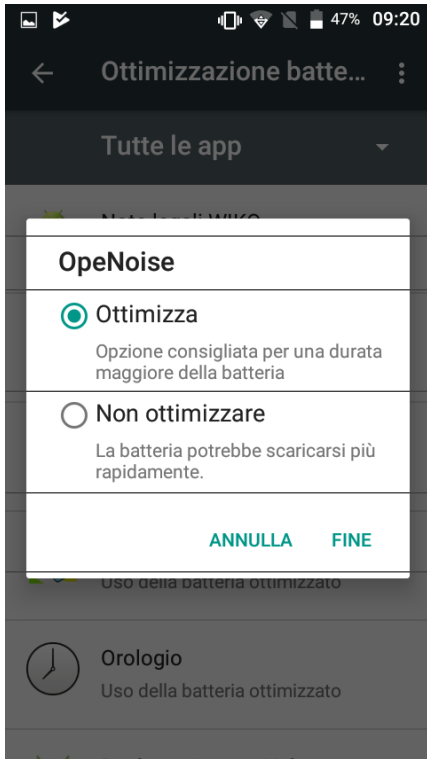
Configura app	*App configuration*
Autorizzazioni app	*App authorizations*
Link alle app	*Link to the app*
Avanzate	*Advanced settings*
App predefinite	*Predefined app*
Spostamento su altre app	*Moving to other app*
Modifica impostazioni sistema	*Changes to system settings*
Ottimizzazione batteria	*Battery optimization*

Clicking the "Gear symbol" will open the "App configuration" page.

From here you have to click on the "Battery optimization" button. Doing this you will be able to enter the page which allows you to configurate at its best the OpeNoise app.

Ottimizzazione batte...	*Battery optimization*
Tutte le app	*All the app*
360 Security	*360 Security*
Uso della batteria ottimizzato	*Battery usage optimized*
Aggiornamento sistema	*System update*
Uso della batteria ottimizzato	*Battery usage optimized*
Android System WebView	*Android System WebView*
Uso della batteria ottimizzato	*Battery usage optimized*
ApeApnSetting	*ApeApnSetting*
Uso della batteria ottimizzato	*Battery usage optimized*
Applicazioni protette	*App under protection*
Uso della batteria ottimizzato	*Battery usage optimized*
Ńotizie e meteo	*News and weather*
Uso della batteria ottimizzato	*Battery usage optimized*
Omacp	*Omacp*
Uso della batteria ottimizzato	*Battery usage optimized*
OpeNoise	*OpeNoise*
Uso della batteria ottimizzato	*Battery usage optimized*
Orologio	*Time*
Uso della batteria ottimizzato	*Battery usage optimized*

In the "Battery optimization" page you have to click on the "OpeNoise" button, this will allow you to change the battery setting of the app.

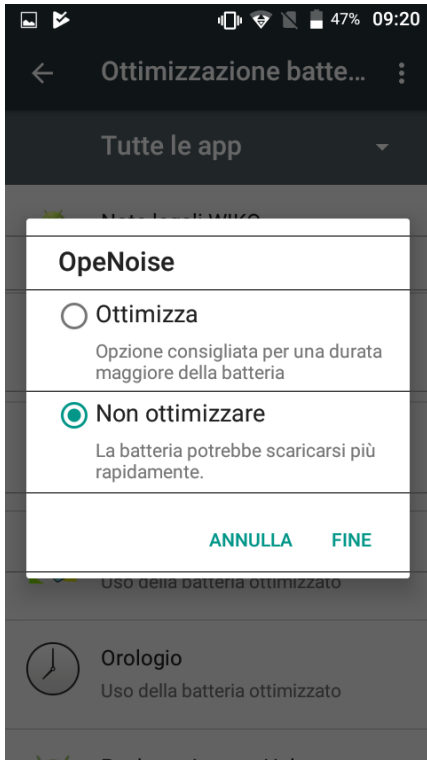|	
	OpeNoise
	Optimize *This option is suggested for a longer lasting of the battery*
	Do not optimize *Battery might last less*
	Cancel End

This screen will open. As you can see in the image above the battery optimization option is switched on as defautl option.

You MUST change this setting to avoid possible stopping in the recording by the app.

⬛ ▶ 🔘 ❖ ◤ ▬ 47% 09:20	
← Ottimizzazione batte... ⋮	
Tutte le app ▾	
OpeNoise	*OpeNoise*
◯ Ottimizza Opzione consigliata per una durata maggiore della batteria	*Optimize* *This option is suggested for a longer lasting of the battery*
◉ Non ottimizzare La batteria potrebbe scaricarsi più rapidamente.	*Do not optimize* *Battery might last less*
ANNULLA **FINE**	*Cancel* *End*
Uso della batteria ottimizzato	
🕐 Orologio Uso della batteria ottimizzato	

To change the option you have to click on the "Do not optimize" button. Once you have done this you must click on the "End" button to save the new setting.

After clicking on the "End" button you can close the "Setting" page of the device and you can start using the OpeNoise app.