Open Sound Meter



Overview v1.2

iPad OS



Version for the iPadOS/iPhone available at App Store by commerce license.



What is Open Sound Meter

Cross-platform measurement application for tuning sound systems in real-time



Main goals

- Keep only really needed functions
- Individual functions should be easily and quickly accessible
- **S**imple interface
- **Support young engineers**

Similar to a design principle noted by the U.S. Navy in 1960: keep it simple, stupid



Supported systems

iPad, iPhone	from iOS12
macOS	from 10.13
Windows x64	from 7
Linux	AppImage (Glibc 2.29 or above)

If you can't find binaries for your system, build it with Qt5.15

Is it free? Really?

Desktop versions are distributed by the model pay what you want

Just remember, every donation is a great help for further development.

iOS version are distributed by low reasonable price.

https://opensoundmeter.com/about



Where can I get it?

<u>opensoundmeter.com</u>



Let's run



Layout



Charts area

Up to three charts of different types:

- RTA
- Magnitude
- Phase
- Impulse
- Step
- Coherence
- Group delay
- Spectrogram
- Phase delay
- Level
- SPL

- Crest factor
- Nyquist plot



Tools and sources



Levels meter for measuring and reference channels Icons for delete and clone

Charts area



Selected source has bold line and always on top on other charts z-order of charts corresponds to the sources order

Properties

Click any object (chart, measurement, generator etc) to open properties in the bottom bar.





Generator properties



Generator properties

frequency for sin type





Generator properties

M-Noise[™]

https://m-noise.org/



The M-Noise test signal was created by Meyer Sound Laboratories, Incorporated ("Meyer Sound") for the use and benefit of the professional audio community.

How to use it: <u>https://m-noise.org/procedure/</u>

M-Noise is a trademark of Meyer Sound Laboratories





right click on the color checker applies next color from application's palette

Averaging

LPF	•	0.25Hz	•	+/-	C	Calibrate	Measurement	0,00dB	94 dB	0,02ms	0,00 ms
14	•	Hann	•	M: 1	•	R: 1 🔻	Built-in Microphone			•	STORE

Averaging type: off, FIFO, LPF (low pass filter) FIFO size from 1 to 100

LPF frequencies: ¼Hz, ½Hz, 1Hz

What is LPF and why use it:

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<u>facebook.com/notes/pavel-smokotnin/averaging-of-the-measurements/</u> 1070092436507447/

Applying a calibration file

LPF	•	0.25Hz	•	+/-	C	Calibrate	Measurement	0,00dB	94 dB	0,02ms	0,00 ms
14	•	Hann	•	M: 1	•	R: 1 👻	Built-in Microphone			-	STORE

Click to enable or disable

File selection dialogue will appear on first click

If you want to change the file click at ...



Gain and delay

LPF	•	0.25Hz	•	+/-	C	Calibrate	Measurement	0,00dB	94 dB	0,02ms	0,00 ms
14	•	Hann	•	M: 1	•	R: 1 🔻	Built-in Microphone			•	STORE

Input value

Use keys \uparrow and \downarrow to adjust value, Use Shift key for fine adjustment

Button shows the calculated estimated delay value, click to apply

On mouseover tooltip shows delta between current and estimated

Gain and delay

Apply auto gain for 94 dB SPL A slow

LPF	•	0.25Hz	•	+/-	C	Calibrate	Measurement	0,00dB	94 dB	0,02ms	0,00 ms
14	•	Hann	•	M: 1	•	R: 1 🔹	Built-in Microphone			•	STORE



FFT power

LPF -	0.25Hz 🔻	+/- 2	Calibrate	Measurement	0,00dB	94 dB	0,02ms	0,00 ms
14 👻	Hann 👻	M: 1 🔹	R: 1 🗸	Built-in Microphone			-	STORE

Select time window size: 2^{power value} samples

power	10	11	12	13	14	15	16
samples	1024	2048	4096	8192	16384	32768	65536
time window ; ms	21,3	42,6	85,3	170,5	341	682,6	1365,3
frequency step, Hz	47	23,5	11,7	5,9	2,93	1,46	0,73

* - for sample rate: 48 000Hz

Logarithm time window

LPF 🔻	0.2	5Hz	•	+/-	C	Calibrate	Measurement	0,00dB	5,40ms	0,02 ms
LTW 🔫	На	nn	•	M: Mic	:1 •	R: Line 3 🔻	Scarlett 18i6 USB		•	STORE

- 24 frequencies per octave
- each has its own time window





Logarithm time window



Storing your measurements

LPF	•	0.25Hz	•	+/-	C	Calibrate	Measurement	0,00dB	5,40ms	0,02 ms
LTW	•	Hann	•	M: Mic	1 🔻	R: Line 3 🔻	Scarlett 18i6 USB		-	STORE

Push the button to store current measuring data

Stored series will appear at the charts and its label in the right bar Name of the store will contain the name of the original measurement and time.

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Enable/disable checkbox = view/hide the series

Stored properties



Stored properties

Offline adjustment



inverse magnitude



Stored properties

Offline adjustment



Math source



select from 2 to 10 sources: measurements or stored



Filter source



Basic chart properties



Impulse chart properties



Select linear or log (dB) vertical scale

RTA chart properties



Magnitude chart properties



Apply coherence value for the series opacity

Phase chart properties



Points per octave

Phase chart range



Coherence chart properties



Points per octave



Coherence chart properties



Show help line and its value



Spectrogram chart properties



Points per octave



Level chart properties





SPL chart

SPL C Fast 94.7 Measurement	SPL C Slow 85.7 Measurement	SPL A Fast 87.9 Measurement	SPL A Slow 84.4 Measurement		
Measurement - 1 - 4 -	SPL - C -	Fast 👻 — 85,	00dB +		

- columns count
- rows count

SPL chart



Wavelength calculator



Allows you calculate between frequency, period and wavelength. You can change any value and get others. Use Shift key to fine adjust value

To quick open calculator for interested frequency click the right mouse button on a chart.

On iPad put one finger at the interesting point and

touch the chart with second one.



Different instances of Open Sound Meter on the same network could share data



If you activate Server application will share data If you activate Client application will receive data from Server



Remote sources shown in the side bar as a regular sources with a label from what host it was taken. Each remote source has coloured label:

- it was just updated less than 1 second ago
- it was updated more than 1 second ago
- error occurred during last update

Refresh button allows to manually update source from the Server.



For remote sources you can change all settings but audio. Unavailable options are disabled.



REFRESH Vector Sum @ Pavel-Smokotnin.local

If remote source have no settings to edit, you'll see only refresh data button.





You are able to use remote sources in the math operations as well as locals, even mix them.

Application menu (iPad)



Swipe from left side to the right to open menu. Or click menu button in the top right corner.

Target trace



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Application menu



New – create empty measuring project

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Save – save all current measurements and stored data to a file
Open – load project file or single stored data
Recent projects – list of the last opened files
Import – data from txt or csv format

Application menu



Append measurement – add a single measurement to the project
Add math source – add a single virtual math source
Add elc – add equal loudness contour
Show target – toggle target trace



Experimental functions



Adds three more available charts:

- Crest factor of the measurements
- Nyquist plot
- Phase delay

Dark mode



Thanks to Josh Barker for contribution

Update application

Open Sound Meter checks for updates at every start if internet connection is available. You will see a message about update.

For manually check, use the menu item: "Help > Check for update".

ÓpenSoundMeter File	View	Help	
	_	Search	
18		Check for update	



Shortcuts

Action	macOS	Windows and Linux
new project	策+N	Ctrl+N
save	策+S	Ctrl+S
open	光+O	Ctrl+O
append measurement	₩+A	Ctrl+A
append math source	策+M	Ctrl+M
add ELC	₩+L	Ctrl+L
store all measurements	策+X	Ctrl+X
store current measurement	策+C	Ctrl+C
reset averages	ዤ+R	Ctrl+R
apply estimated delay	₩+E	Ctrl+E
Toggle target trace	策+T	Ctrl+T



Shortcuts

Action	macOS	Windows and Linux
toggle generator	策+G	Ctrl+G
show 1 chart	₩+1	Ctrl+1
show 2 chart	米+ 2	Ctrl+2
show 3 chart	₩+3	Ctrl+3
auto charts height	∺+ 4	Ctrl+4
open wavelength calculator	₩+W	Ctrl+W
toggle dark mod	光+D	Ctrl+D
show shortcuts	F1	F1
show info	F2	F2
check for update	F3	F3

How can you contribute?

- Donate <u>opensoundmeter.com/about</u>
- Share this overview with all the sound engineers
- Send me your ideas and wishes about the project
- Give me detailed reports about the errors or crushes
- Create new functions and fix issues if you are a programmer

Thank you for support!



Consulting

We provide consulting service and trainings for users.

Visit https://opensoundmeter.com/consulting for the details.





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