

ULTRAMIC384K**PRO**

High performance and wideband Ultrasonic USB microphone



USER GUIDE

0.2

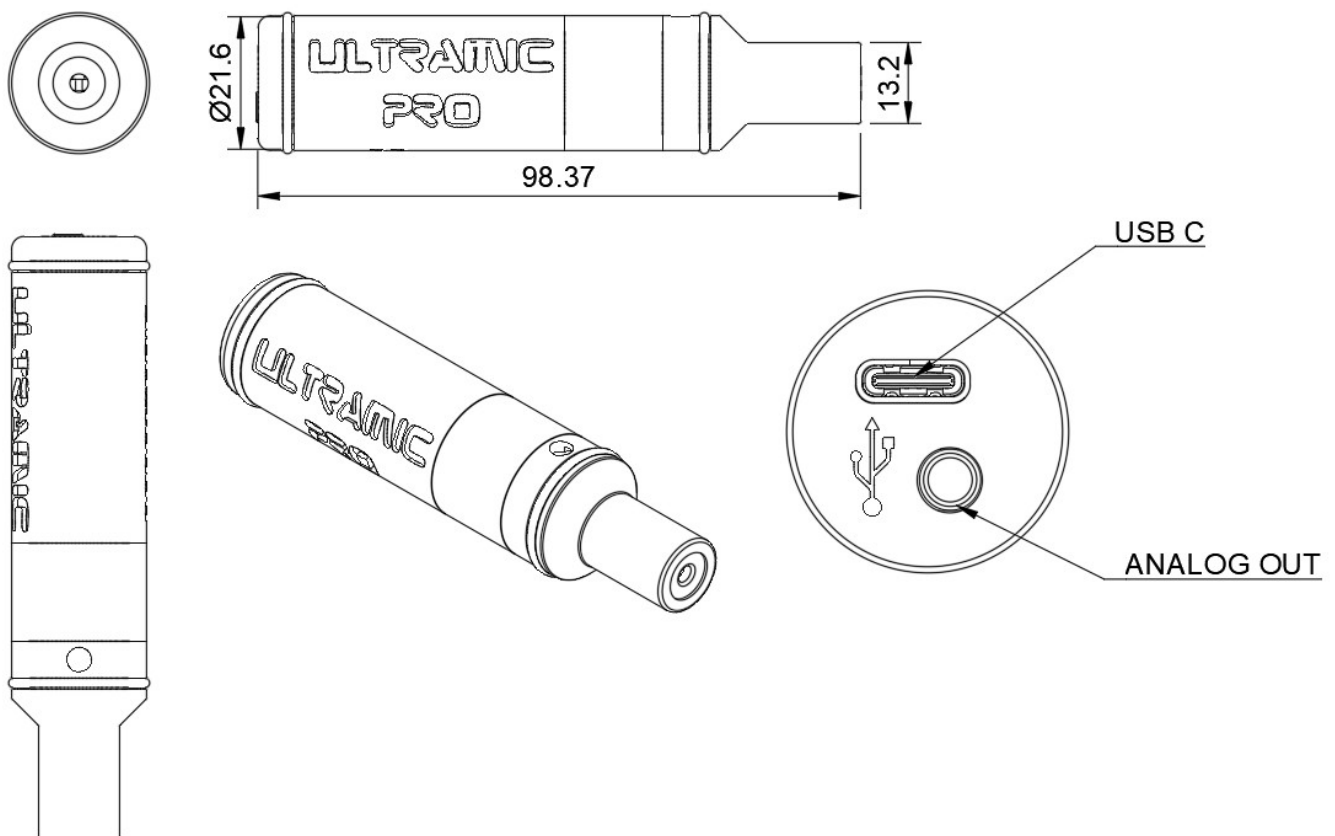
Overview & Key Features

The Ultramic series represents a pioneering lineage of high-performance USB audio and ultrasonic microphones. Building upon the legacy of the Ultramic250K—the world's first USB audio microphone—the new Ultramic384K PRO introduces significant enhancements for professional acoustic research and industrial monitoring.

With a high-end sampling rate of 384 kHz, the device is capable of seamlessly detecting and recording signals spanning from the audible range up to ultrasonic frequencies of 192 kHz. It connects natively via a USB 2.0 Full Speed port to Host systems such as PCs, iOS/Android smartphones or tablets, and embedded Linux systems.

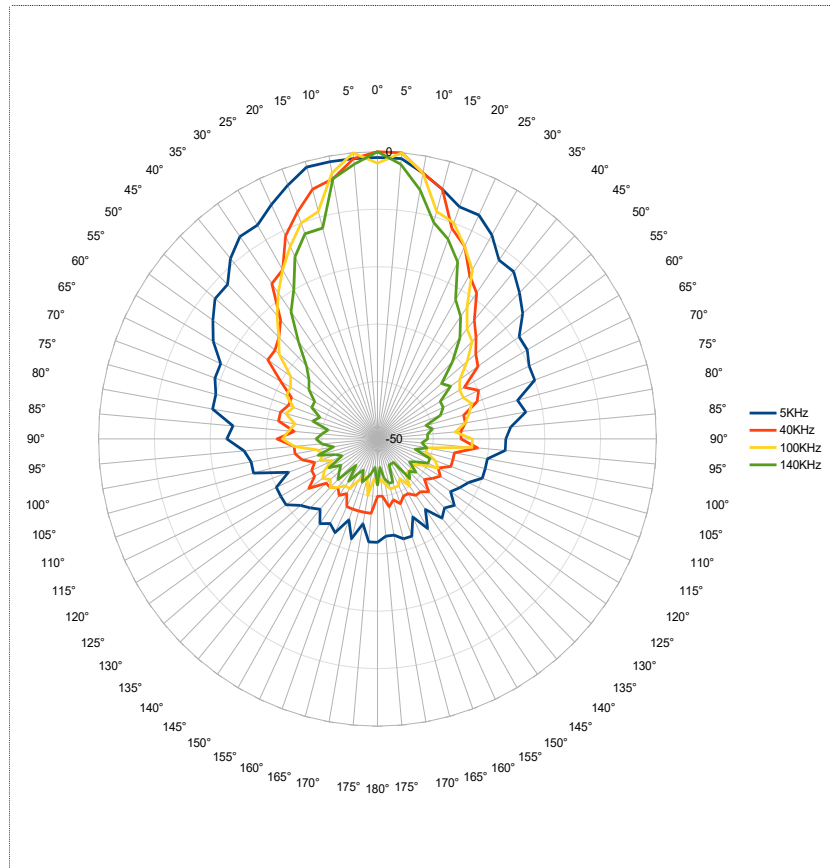
Key Features:

- **MEMS Sensor:** High-performance, wideband omnidirectional acoustic and ultrasonic sensor.
- **Driverless Interface:** Uses standard USB Audio Class (UAC 1.1) for immediate Plug & Play functionality across multiple operating systems.
- **Removable Magnetic Cone:** An optional cone comes to enhance the microphone's directionality while offering sensor protection.

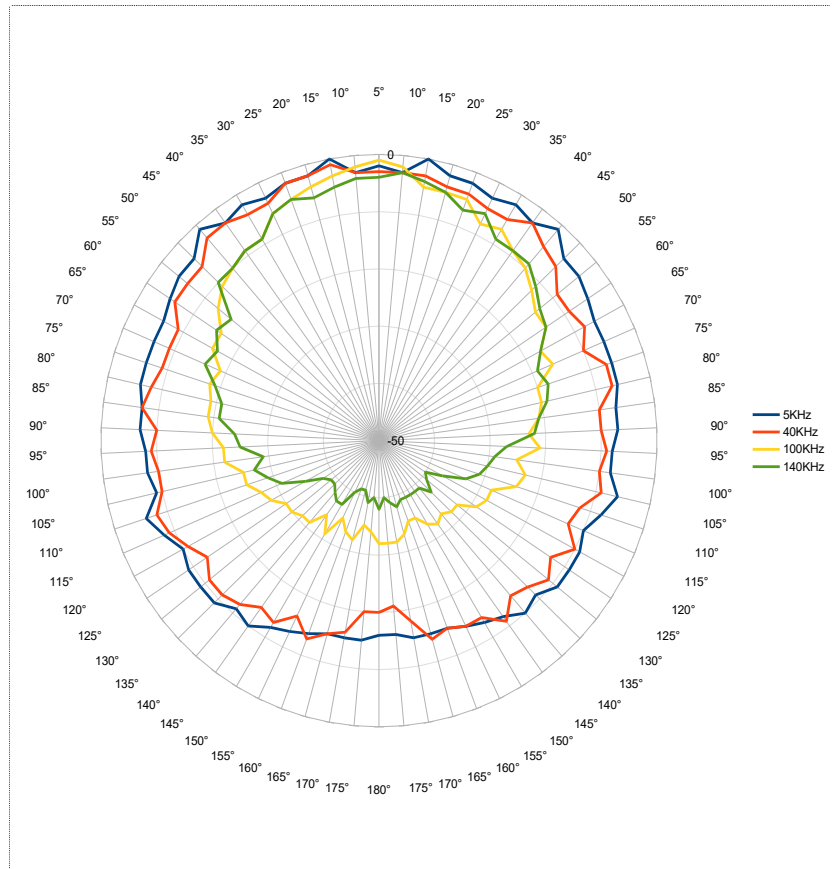


Planar plot

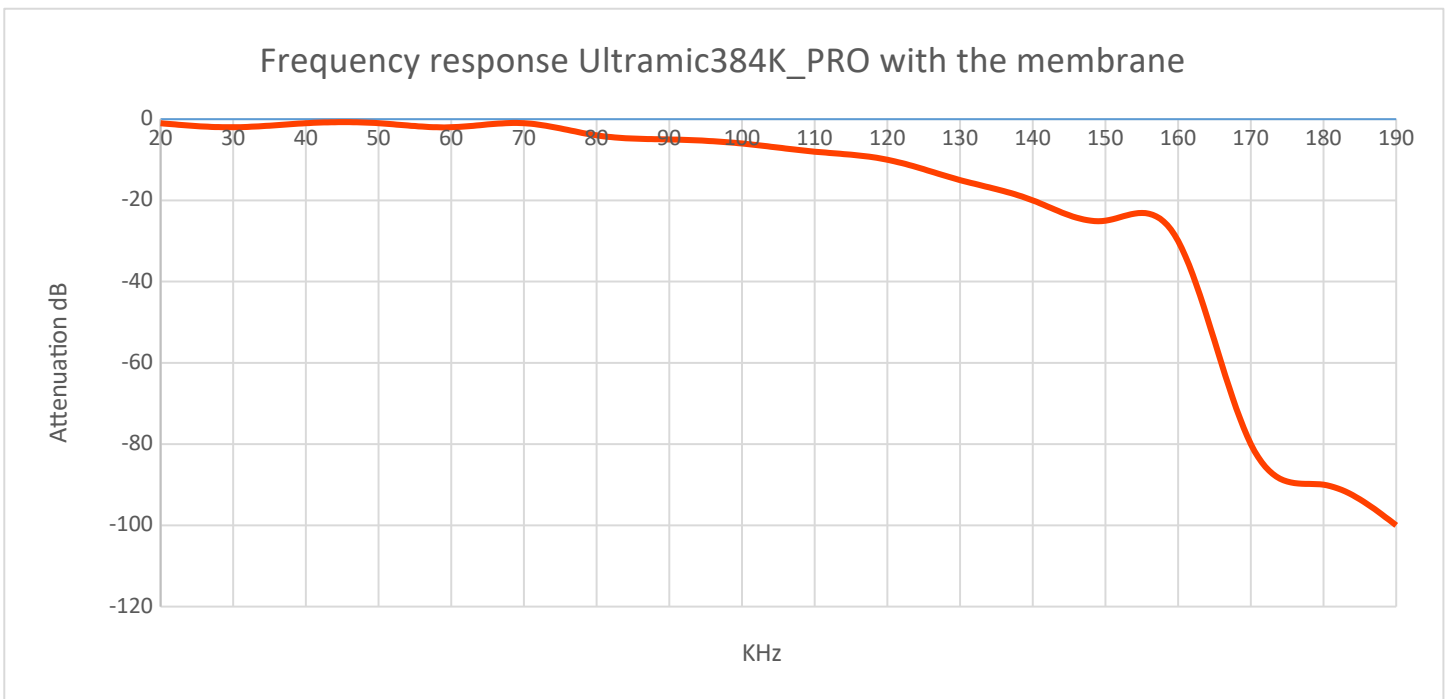
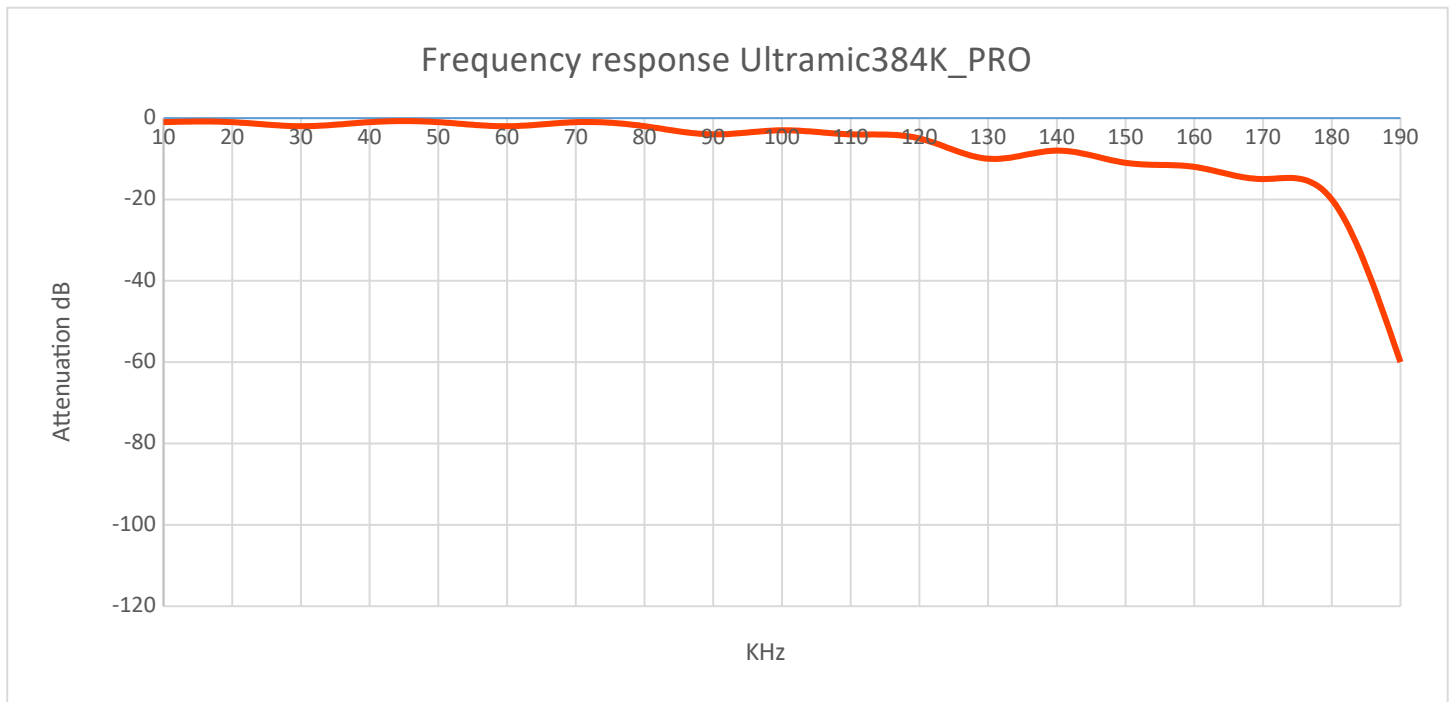
ULTRAMIC384k_PRO
with cone mounted



ULTRAMIC384k_PRO
with cone unmounted



Frequency response



Windows Sound Settings: Disabling Voice Clarity for Ultrasonic Recording

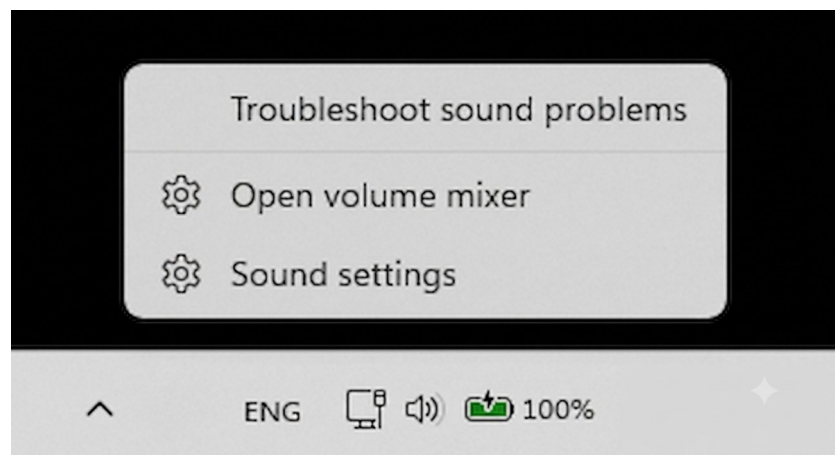
This tutorial guides you through disabling the Windows "Voice Clarity" feature. **This step is crucial when using an Ultramic, as Windows' default processing will automatically cut off all ultrasonic frequencies, filtering out the high-frequency data you need.** Disabling it ensures you get a raw, unfiltered signal.

Step 1: Accessing Sound Settings

Locate the speaker icon in the notification area of your Windows taskbar (bottom-right corner).

Right-click on the speaker icon.

From the pop-up menu, select "Sound settings."

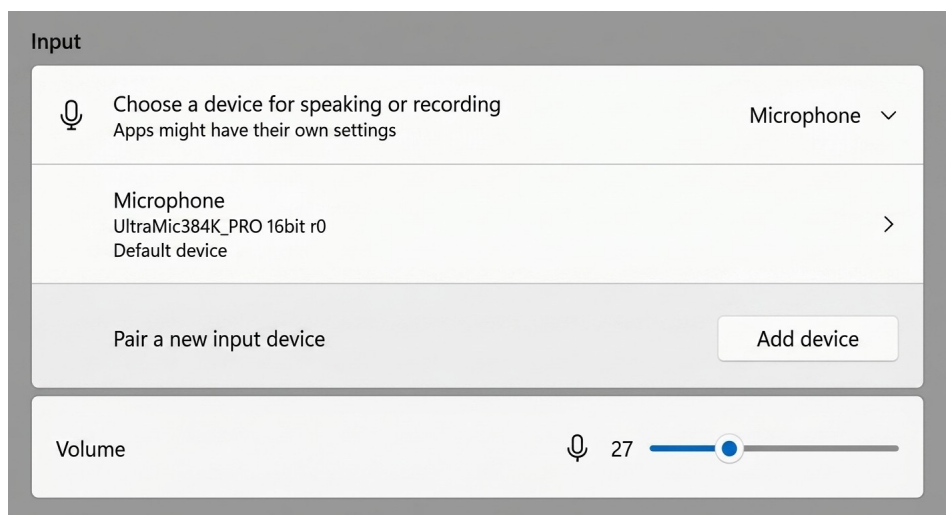


Step 2: Choosing Your Microphone

A new settings window will open. Scroll down to the "Input" section.

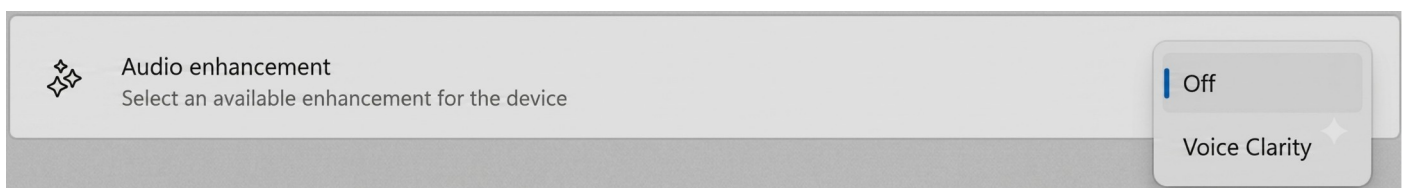
You will see a list of available input devices. Identify the microphone you wish to configure.

Click on the arrow (>) next to UltraMic384K_PRO.



Step 3: Turning Off Voice Clarity

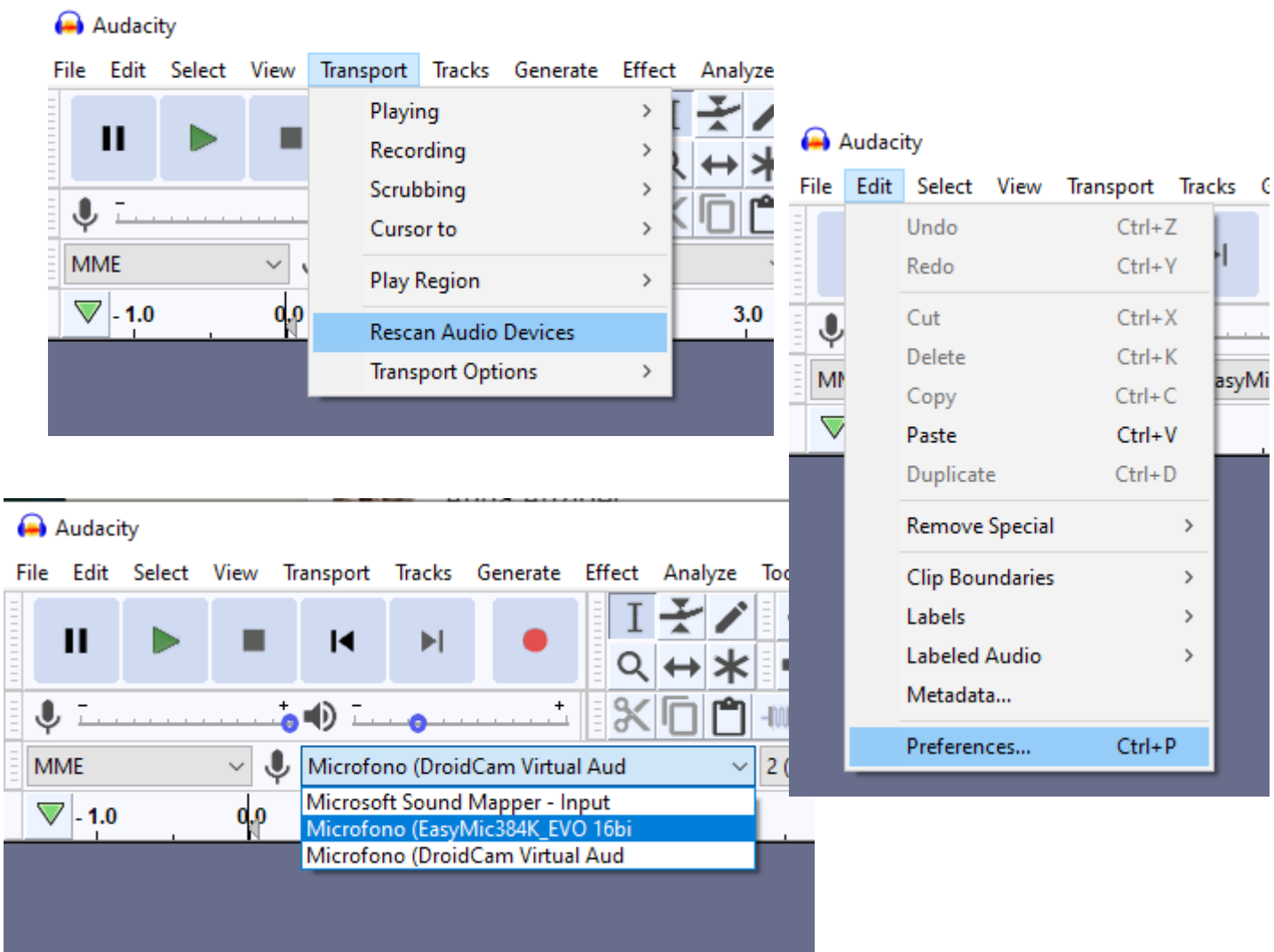
Click on the drop-down menu for "Voice Clarity." Select "Off" to disable the enhancement. If it is already set to "Off," no further action is needed.

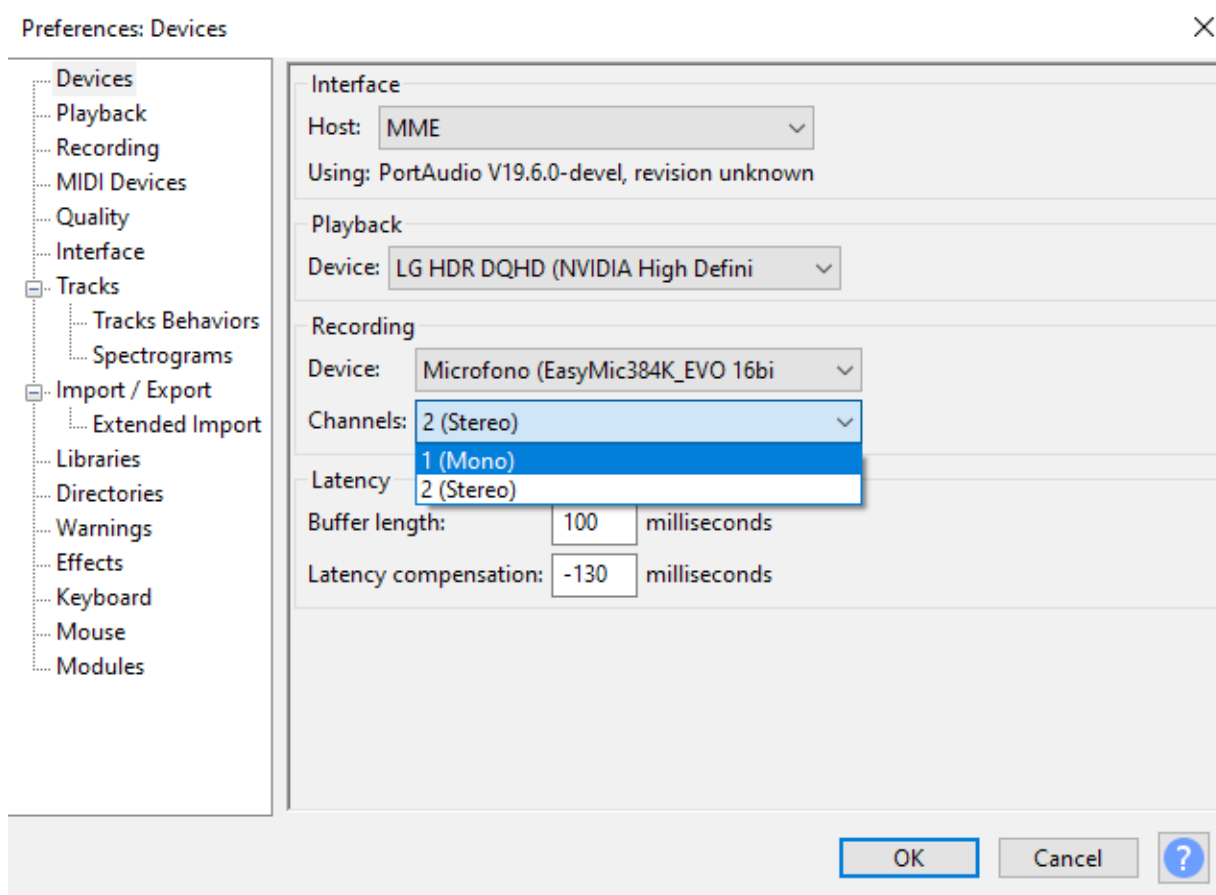
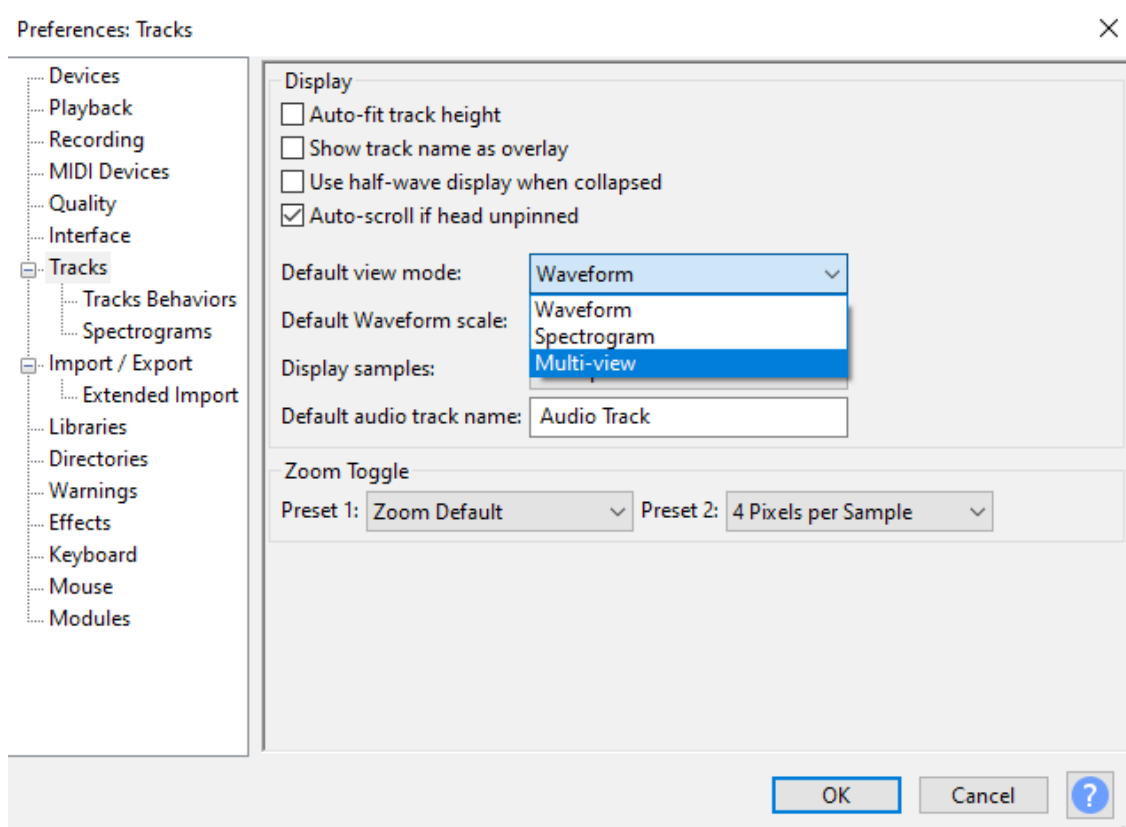


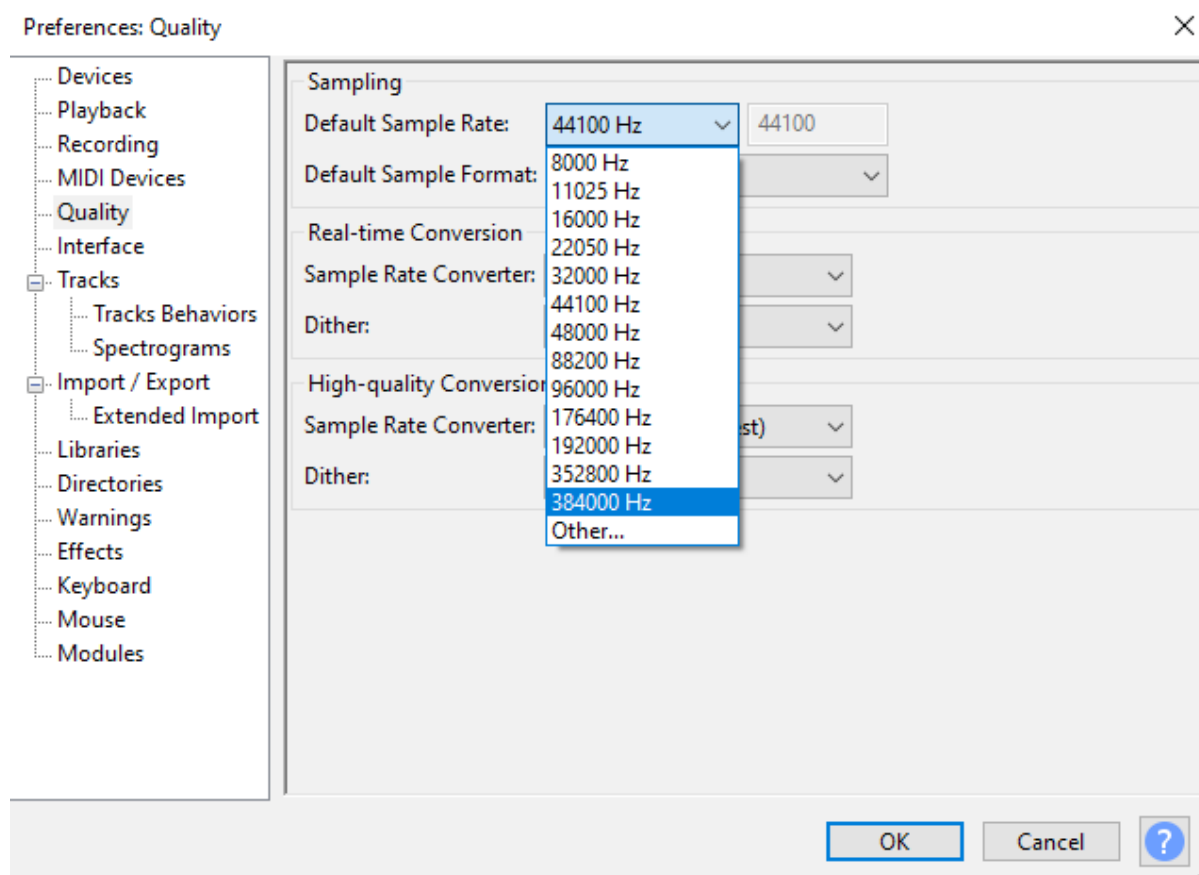
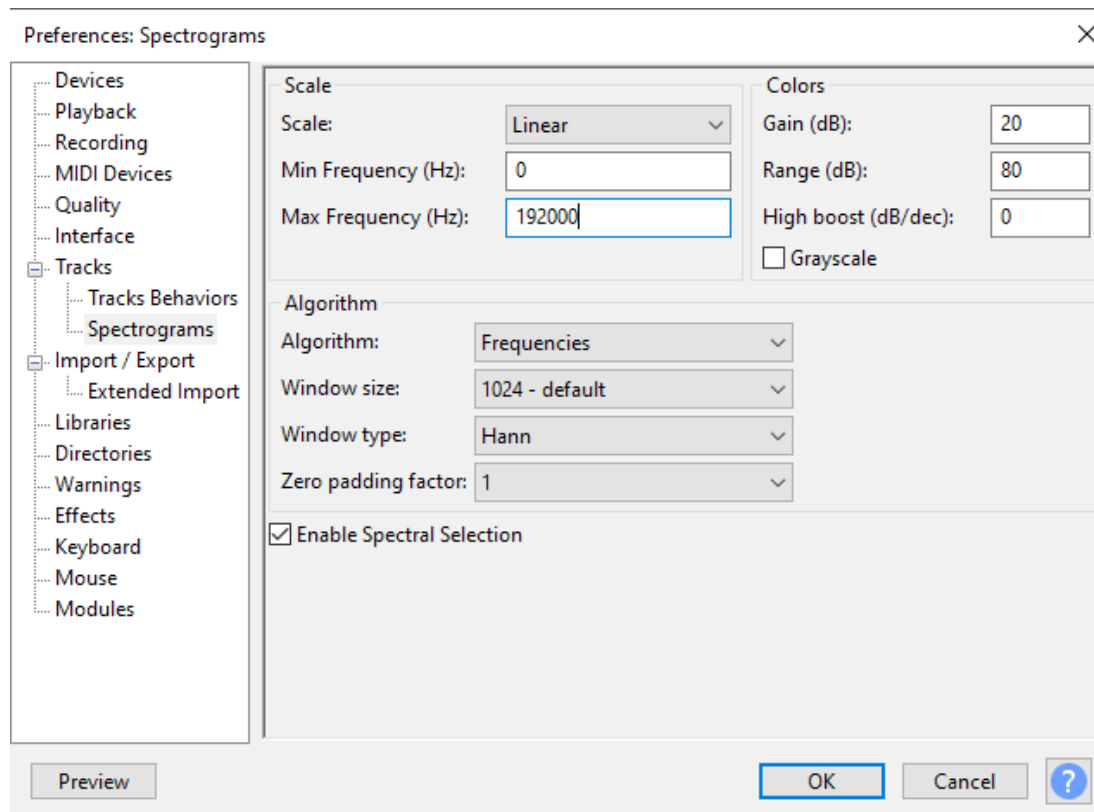
Software Configuration: Audacity Setup

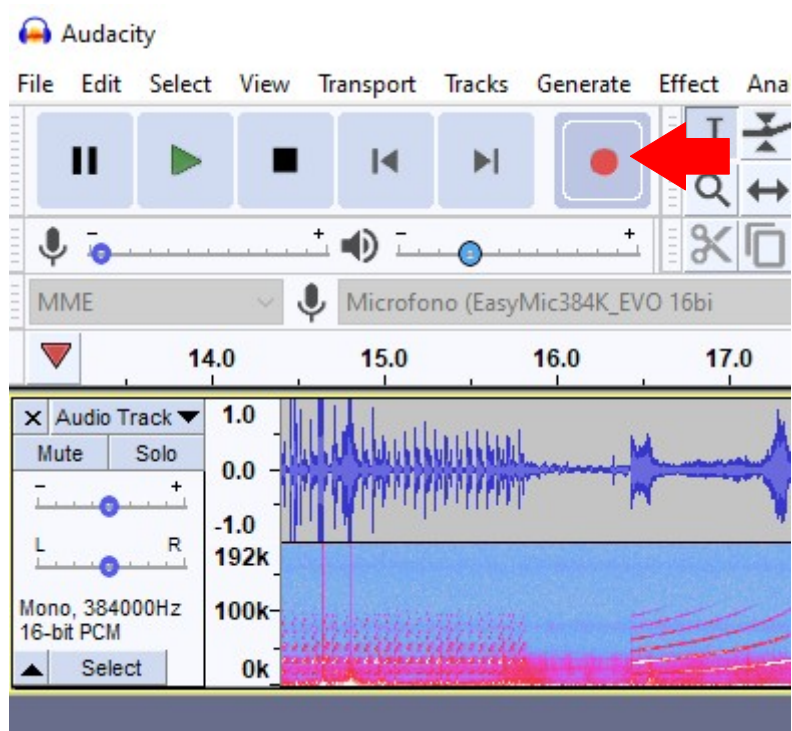
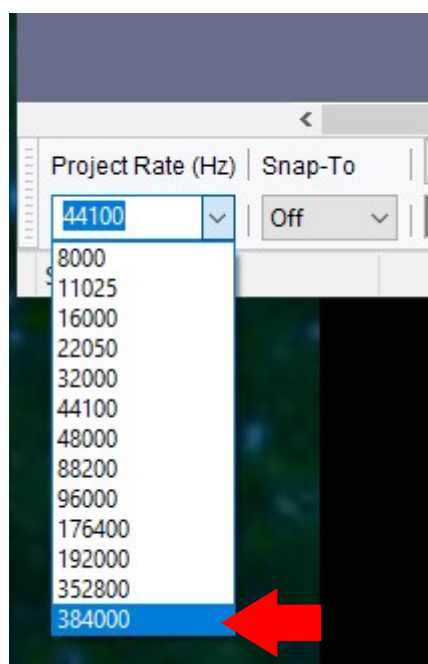
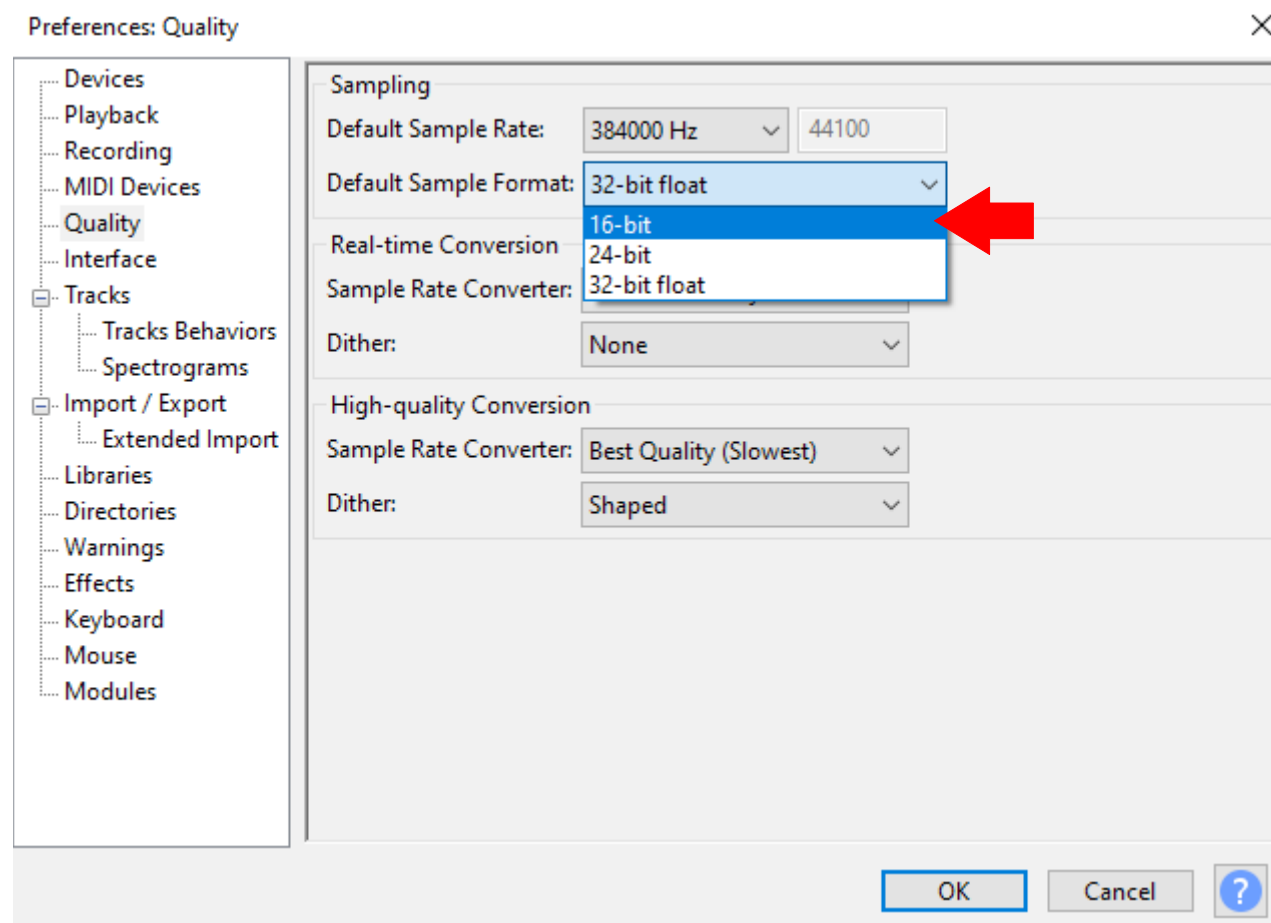
To correctly capture the full spectrum up to 192 kHz in Audacity, you must precisely configure your workspace preferences:

1. **Device Recognition:** Navigate to the top menu and select Transport > Rescan Audio Devices if the microphone was connected after opening the program.
2. **Device Selection:** Open the preferences menu (Edit > Preferences or Ctrl+P). Go to the Devices tab. Under the Recording section, select Microphone (UltraMic384K_PRO). Ensure channels are configured to Mono.
3. **Quality & Sampling Rate:** Switch to the Quality tab within Preferences. Set the Default Sample Rate to 384000 Hz. Set the default sample format to 16-bit PCM. Make sure the Project Rate at the bottom of the main Audacity window is also explicitly set to 384000 Hz.
4. **Spectrogram View:** To visualize ultrasonic data, navigate to the Tracks preference menu, choose Spectrograms, and ensure the Max Frequency (Hz) is adjusted to 192000. You can then change the track view from Waveform to Spectrogram via the track control panel dropdown.









Technical Specifications

Parameter	Specification
Recording format	Linear PCM (Pulse Code Modulation) format
Connectivity	USB 2.0 Full Speed, USB-C Connector (USB Audio Class 1.1)
Dimensions & Weight	Microphone body: 99 mm (length) x 22 mm (diameter) Cone: 37 x 25 x 18 mm Weight: 29.5 g
Sensitivity	-41.5 dBFS @ 94 dB SPL (Tested with Class 1 calibrator IEC 60942-2003 / ANSI S1.40-1984 at 1 kHz)
Sampling frequency	384 kHz
Resolution	16 bit
Amplification	High-quality, low-noise integrated hardware amplification with a low-pass filter cutting off at 190 kHz
CPU	32 bit integrated ARM Cortex M4 microcontroller
Power	15 mA power requirement when connected to a USB host
Microphone sensor	MEMS sensor

Test devices:

SENSOR = BRÜEL & KJÆR 4138

PREAMPLI= BRÜEL & KJÆR 2669

AMPLI= BRÜEL & KJÆR NEXUS 2690; software version Boot: 1.10, application 2.50.

WH3219 = BRÜEL & KJÆR frequency extension (140kHz -1dB; 200kHz -3 dB).

Calibrator = Temna 72-2680 94dB / 114dB

Sampler ADC: Ultramic384K 384kHz sampling rate 16 bit

Software = Multi-Instrument Pro 3.7

Waveform generator:

Owon AG2052F Bandwidth 50Mhz 300 MS/s Resolution 14 bit

Ultrasonic emitter:

- US-4112 Sobreton
- Ribbon loudspeaker

MULTIMETER: Fluke True RMS 289

Applications

BIOACOUSTICS

- Detecting and recording biological ultrasounds for behavioral and population studies on bats, rodents, and insects.
- Environmental impact assessment surveys (e.g., evaluating wind farm impacts on local bat populations).
- Recording and analyzing ultrasonic vocalizations (USVs) in laboratory mice for pharmaceutical research.
- Sound design and special effects processing (e.g., pitch-shifting or time-stretching recorded ultrasounds into the audible spectrum).

Industrial & Engineering

- High-precision gas and air leak detection.
- Predictive maintenance via acoustic monitoring of motor faults and bearing wear.
- Analysis of high-frequency noise emitted by switching power supplies, LCD screens, energy-saving lamps, and automotive turbines (car/truck turbochargers).

Quick Start Guide

Usage with a Personal Computer (Windows/Mac/Linux)

1. Connect the microphone to an available USB port on your computer using a compatible cable.
2. The operating system will automatically recognize the device as a standard USB audio device and configure the necessary native audio framework within less than a minute. No proprietary drivers are needed.
3. Launch your preferred audio analysis software (such as Audacity). A list of fully compatible applications is available at www.dodotronic.com.

Usage with a Smartphone or Tablet (Android/iOS)

1. Connect the Ultramic to your mobile device using a suitable USB-C cable.
2. Download and open a compatible recording app, such as **Bat Recorder**.
3. Connect headphones to your mobile device to listen to real-time, frequency-translated (time-expanded or heterodyne) audio of the ultrasonic environment. Refer to the application's online guide to leverage advanced analysis tools.

Troubleshooting & FAQ

Q: Can I connect the Ultramic384K to my analog audio recorder?

A: No. The Ultramic384K is an entirely digital device that processes sound internally and outputs it exclusively via USB. It cannot be connected to traditional analog microphone inputs or recorders.

Q: Can I record standard audible audio and ultrasonic frequencies simultaneously?

A: Yes. The microphone does not utilize an integrated high-pass filter, meaning it seamlessly captures the entire spectrum from standard low-frequency audio up to high-frequency ultrasound at the same time.

Q: My software does not capture any audio stream or crashes when I connect the device.

A: Not all audio software or recording platforms natively support high professional sampling rates like 384 kHz. Verify that your software is updated and that its configuration allows for a 384 kHz sample rate. Ensure that the correct input device source is selected in your system settings.

Q: I am recording in real-time, but my spectrogram shows a sharp cut-off at 20 kHz.

A: This usually happens if your operating system or software is using your computer's integrated internal microphone instead of the Ultramic, or if Windows "Voice Clarity" enhancements are still enabled. Please review the input device settings and disable audio

Safety, Care & Compliance

Safety Precautions

- Do not subject the device to organic solvents, alcohol, or harsh chemical thinners for cleaning purposes. Clean only with a dry, lint-free cloth.
- Avoid leaving the device exposed to prolonged direct sunlight or extreme thermal environments.
- Protect the microphone from strong impacts, mechanical drops, severe vibration, water exposure, and heavy dust environments.
- Caution: Disconnect the microphone immediately if you notice anomalies such as smoke, unusual odors, or unexpected high-temperature spikes on the casing.

Conformity declaration

model: ULTRAMIC384K PRO

Ultramic is in conformity with the protection and compliance requirements of the following EC Directives:

- 2004/108/CE
- 2006/95/CE

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