# wearable sensors

- Muse 2 EEG headband
- Genki Wave
- Apple watch , iphone
- DIY projects

# Muse 2 EEG headband

Muse is a smart headband that acts as your personal meditation coach. Using advanced EEG brain sensors, Muse can detect your brain activity and provide you with real-time feedback in the form of gentle audio sounds through your headphones (regular use in the Muse app). Primarily advertised as a neurofeedback tool, the headband tracks heart rate (**PPG + Pulse Oximetry**), angular velocity (**gyroscope**), proper acceleration (**accelerometer**), and electroencephalography (**dry electrodes**) to assist you in your meditation sessions.

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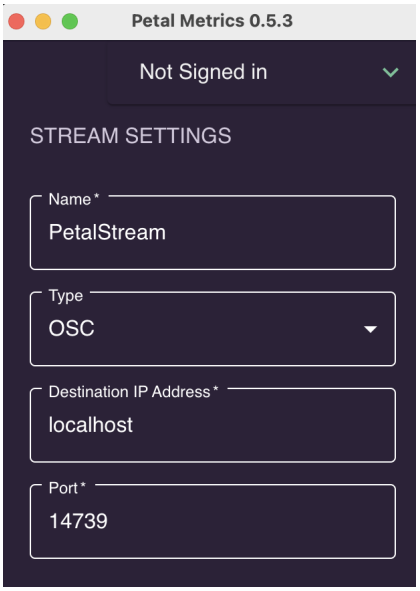
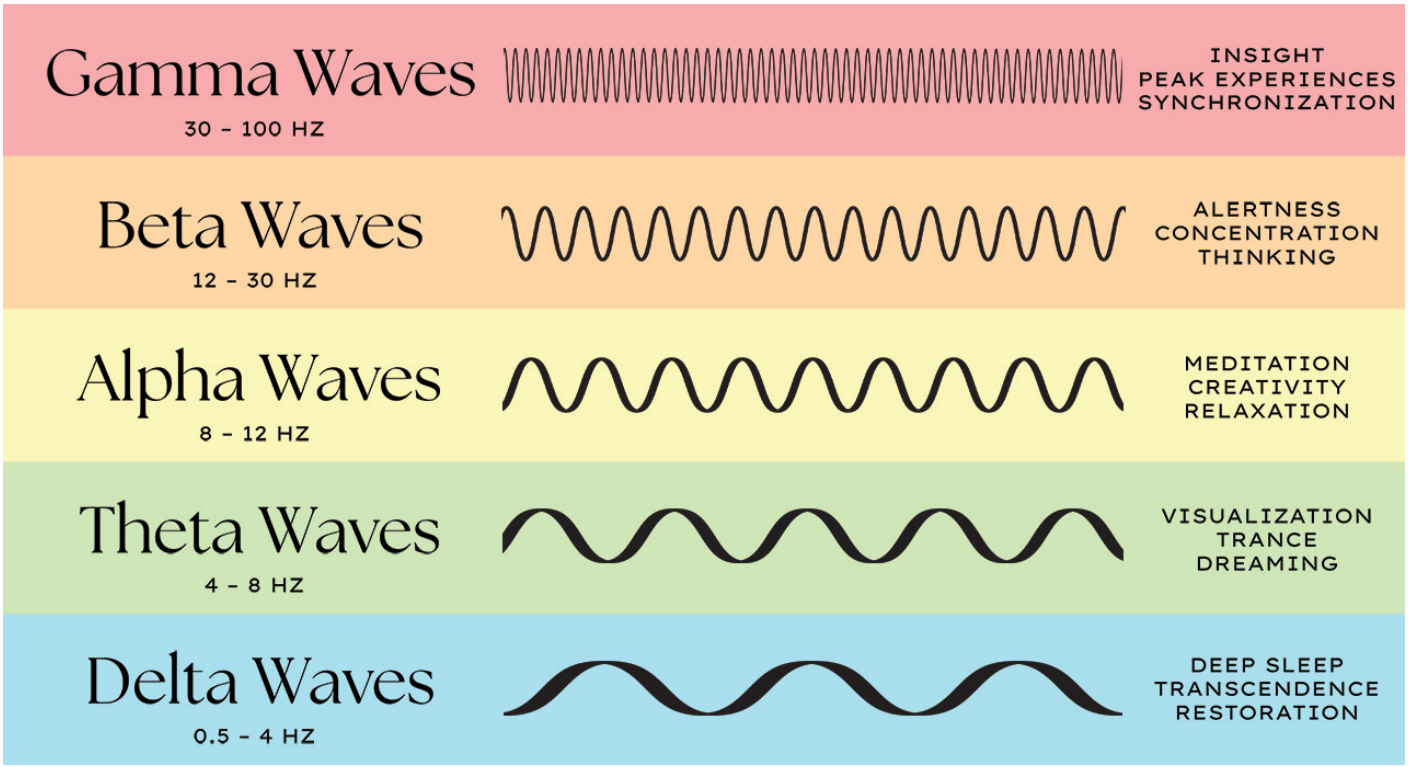
|---|---|
| The Muse can be connected to your computer using Petal Metrics: https://petal.tech/downloads<br>This tool allows you to send the EEG data to your computer through OSC.<br><br>Update 2024: this app is no longer free. |  |

Brain waves are measured in hertz (Hz), which refers to cycles per second.




## Muse 2 in Touchdesigner:

https://www.youtube.com/embed/Br0JXvuzWEI

This video covers how to connect the Muse 2 device into TouchDesigner.
Using OSC ports (muse app, paid) to get the data, we will build a simple generative animation controlled with the mind.

The connected app is *Mind Monitor (paid)*

>> OSC specs for Mind Monitor : https://mind-monitor.com/FAQ.php#oscspec
This app is available in the Blackbox JK (ipad)

Download muse_data.tox for touchdesigner use with and OSC app connected to the headset & get named channels (check out de RAW oscIn operator inside the .tox to see the other possibly usefull data being streamed).

more TD examples using the Mind monitor app:

- Mind-Monitor-TouchDesigner-MultiDisplay.toe
- Mind-Monitor-TouchDesigner-Audio.toe
- Mind-Monitor-TouchDesigner-Relative.toe

- Mind-Monitor-TouchDesigner-RAW.toe

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Do you have developer skills : https://choosemuse.my.site.com/s/article/Muse-Software-Development-Kit-SDK-FAQs?language=en_US >> to apply for the SDK

Working in Python: check out: https://github.com/alexandrebarachant/muse-lsl

if you create a workaround to convert this LSL data to OSC, please let us know

Also, a high end tool that will take some effort to use, but seems to be free: https://openvibe.inria.fr/discover/

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## Extra reads:

Interesting article on Medium : Muse 101 — How to start Developing with the Muse 2 right now

# Genki Wave

Wave Midi Ring :  This MIDI controller can add dynamic effects with the tap of a finger, the click of a button, the wave of your hand.

connect to your computer via Softwave

Download the manual here

https://www.youtube.com/embed/TB789hiIJfA

**Working with the Wave in Isadora:**

Softwave software comes with presets on the left side in the interface. Preset 15 is already set to MIDI with channel 15. Go to Menu > Audio/MIDI settings. Here you can choose MIDI output. When you start Isadora it will show "Isadora Virtual In"

In Isadora you receive MIDI by setting your input channel in the Communications > Midi Setup window
Input ports:
Port 1: Wave

Use the Actor Control Watcher: Set Controller to the number of the channel you send MIDI to from Softwave. Like channel 15.

In Softwave you can make your own presets and choose your own channel numbers.
Make a new preset by clicking + next to "Default Preset Blank" at the top of the presets list.
Choose "add function" and a function. In the bottom right of the new function press the MIDI icon > CC to choose a channel like 3.
In Isadora change yout control watcher controller channel to 3 to receive tha values.

Sometimes Isadora looses communication to the Wave, go to midi setup window change the port to none and choose wave again. Connection should be back.

# Apple watch , iphone

TBD

available sensors:

- Proximity sensor
- Ambient light sensor
- Accelerometer
- Magnetometer
- Gyroscopic sensor
- Barometer

ZigSimPro

# DIY projects

start here:

https://www.instructables.com/Beginner-Tips-for-DIY-Wearable-Tech/

https://www.youtube.com/embed/lTuubuYL0Gw

https://www.youtube.com/embed/XsYXhQDBolc

https://www.wearabletutorials.com/how-to-use-led-lights-for-wearables-beginners-guide/

https://www.instructables.com/Wearable-Tech-1-2/

https://www.instructables.com/circuits/wearables/projects/