Muse Developer Resources

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How do I get Muse data into my program?

At this time, LibMuse is available for iOS and Android. Desktop versions of LibMuse are in development, slated for initial release in Q1/Q2 2015. Currently there are two alternatives.

1. Use MuseIO to connect to Muse and stream data over OSC to another program running an OSC server.
2. Implement the Muse Communication Protocol, which defines how Muse packets are encoded and compressed.

How do I install the dependencies for the Muse SDK?

You should not have to manually install any dependencies to use the SDK. The SDK comes packaged as a standalone installer. Older versions required the manual installation of several packages, including things like Google Protocol Buffers. However, this is no longer necessary. We highly recommend uninstalling old versions of the SDK and using the latest one, as it will require much less manual configuration, and you'll be able to get started much faster. Download the latest SDK here: https://sites.google.com/a/interaxon...-site/download

What kinds of data can I get out of the Muse SDK?

Many kinds of data are available in the Muse SDK including raw EEG data, raw accelerometer, raw FFT coefficients, relative and absolute band powers for Alpha, Beta, Delta, Theta, and Gamma waves, blink and jaw clench detection, and more. This data is currently accessible using MuseIO, and will be included in the full native SDK which is coming soon (January/February 2015). For more information, see the MuseIO documentation here:https://sites.google.com/a/interaxon...paths---v3-6-0

I can't seem to get Muse to pair with my computer. What should I do?

The specifics of this are different for every platform, but in general the first thing you should do is to start completely fresh:

1. Factory-reset your Muse. From an off-state, hold the button down for at least 15 seconds until the LEDs begin to flash in an alternating back-and-forth pattern. Then release the button and press it again for about 3 seconds to turn the device off.
2. Make sure to kill any instances of MuseIO that may be running on your computer. Having MuseIO running at the same time as your machine is attempting to pair will cause problems.
3. Delete any previous pairings that may have been established between Muse and your computer.
4. Turn Bluetooth off on your computer, wait ten seconds, and turn it back

on.

5. Attempt to pair.If this doesn't work, make sure your Muse has the latest firmware. This can be done with the Calm application. Assuming you can pair Muse with your mobile device, open Calm and go to Settings -> Check for updates -> Muse headband version. The app will tell you whether or not you are at the latest version.

If you are still having difficulty, you may want to try to use a USB Bluetooth dongle. There is a list of recommended dongles that we have tested for compatibility with Windows 7 (Bluetooth problems are especially prevalent on Windows, as there is less predictability with third-party hardware) on our developer site: https://sites.google.com/a/interaxon...ware/bluetooth

After pairing my Muse in Pairing Mode should Muse continue to stay in Pairing Mode (all lights flashing)?

Yes, pairing mode does not end because a pairing is completed. The only exception to this rule is on iOS mobile devices, which will immediately connect after a pairing.

When I pair Muse with my Mac, it says "Connected" for about 10 seconds, and then "Disconnected". What should I do?

This is the expected behaviour when you pair Muse with your Mac. The pairing process only establishes the pairing. Once it pairs, it disconnects until some other program requests to connect at a later time. So it will initially show "Connected", then after a short time "Disconnected" in the Bluetooth device menu when pairing with Muse.

You must run MuseIO to connect with Muse. The forthcoming LibMuse for desktop will also be able to connect to Muse, of course.

I can pair Muse with my computer, but when I run

MuseIO it disconnects after a few seconds. What should I do?

Make sure your Muse has the latest firmware. This can be done with the Calm application. Assuming you can pair Muse with your mobile device, open Calm and go to Settings -> Check for updates -> Muse headband version. The app will tell you whether or not you are at the latest version.

Often Bluetooth connectivity issues can be alleviated by using an external USB Bluetooth dongle. There is a list of recommended dongles that we have tested for compatibility with Windows 7 (Bluetooth problems are especially prevalent on Windows, as there is less predictability with third-party hardware) on our developer site: https://sites.google.com/a/interaxon...ware/bluetooth

How many Muse can be connected to one computer?

A maximum of 4 is recommended per computer:http://support.apple.com/kb/ht3887#howmany

My computer is asking for passcode when I attempt to pair it with Muse, what should I enter?

If your computer asks you for a PIN, type in "1234".

I can't seem to get good signal with my Muse!

Fit is very important for good signal quality. It is essential that the headband be flat and firmly pressed against your forehead with no hair whatsoever in the way. For the ear electrodes, make sure they are contacting as much skin as possible. If you have long hair, it can help a lot to tie it back into a ponytail or bun. If you wear glasses, consider removing them. The exercises in the Calm app require you to keep your eyes closed, in any case, so you won't require your glasses until after.

Dry skin can also cause bad signal. Consider gently cleaning your forehead and around your ears to potentially improve the connection.

Make sure the Muse electrodes are clean. You can do this buy gently wiping them with a cloth dipped in a moderate amount of rubbing alcohol or hand sanitizer.

Lastly, it is important to sit still for 20-30 seconds after adjusting the headband. The signals from Muse will take a little while to settle down after the headband has been moved. The skin-electrode connection improves gradually over time as a small layer of moisture builds and the electrochemical state reaches an equilibrium. Every time the headband moves relative to the skin, this equilibrium is somewhat interrupted and must be given time to recover.

If you continue to have signal quality issues after following the above instructions, please contact community@interaxon.ca.

How much data is produced per minute?

If storing data to disk, Muse generates about 400KB per minute using 220Hz/4 channels.

What is the time precision accuracy of the data?

The Muse SDK has a 2ms accuracy.

How do I synchronize to an external clock?

To get this working, you would synchronize the clocks on each computer Muse is connected to. Usually you would use NTP for this, which is made to sync clocks on different computers. This is available on all major operating systems.

When will the next update to the SDK be released?

As soon as it is ready! Sign up for the dev mailing list to get the news ASAP:

http://eepurl.com/9M2P1

I want to know more about EEG and BCI, what are some good learning resources?

Check out our list of helpful books and websites on BCI, EEG, neurofeedback, event-related potentials and more in our Intro to Brains.

Comments

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