Download and install the Muse Tools. The installer includes MuseIO, MuseLab, and MusePlayer. Everything will be installed in /Applications/Muse. NOTE: your bash_profile will be modified to add this directory to your PATH. If you are using another shell such as zsh, you will have to modify the appropriate configuration file yourself.

On Linux, everything will be installed in \$HOME.

Pair Muse with your computer

Put Muse into Pairing Mode by holding the button down for five seconds until all five LEDs begin flashing on and off in unison. Release the button.

Open the Bluetooth devices menu on your system. With Bluetooth turned on and your computer discoverable, wait for Muse to appear in the list of available devices. When it does, click on it and ask to pair. If you are prompted with a passcode request, accept it. Wait for the pairing process to complete. Once paired, all five LEDs will continue to flash on and off. This will only change once a streaming connection is established.

NOTE: On some systems, when pairing, Muse will show that it is "Connected", and then after a few seconds "Disconnected". This is normal. Pairing is not the same as connecting. Muse will only show as permanently "Connected" once a program connects to it to stream data. More on that soon.

Connect to the Muse

Open a Terminal and enter the following command:

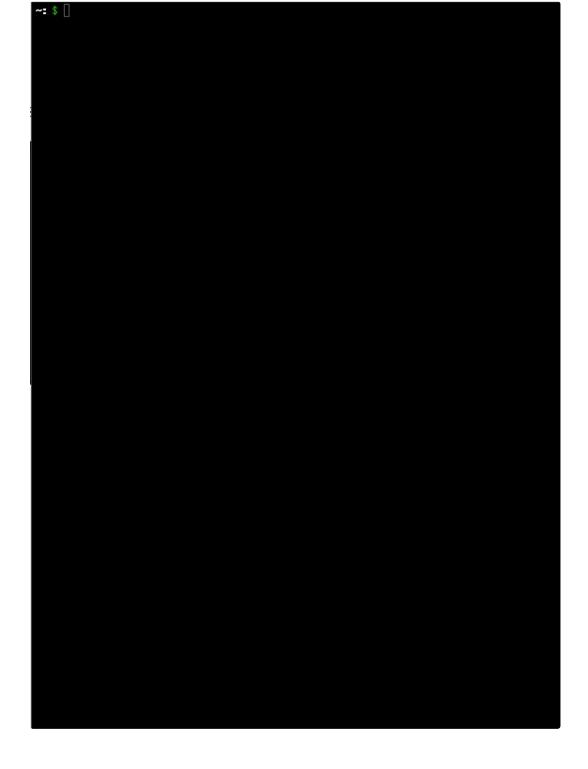
muse-io --device MUSE_DEVICE_NAME

where MUSE_DEVICE_NAME is the name of the Muse device you previously paired. If you have the latest firmware, this will be something like "Muse-1234".

MuseIO will begin searching for your Muse and then attempt to connect with it. This may take up to 30 seconds.

Congratulations! MuseIO is now connected to Muse and is sending out OSC messages containing Muse data to the default TCP port 5000.

NOTE: Don't worry about that "OSC error 61" / "TCP connection failure". It just means that nothing is receiving the messages that MuseIO is sending out. That's what MuseLab will do when we start it.



Start MuseLab receiving on TCP port 5000

With the Finder, navigate to /Applications/Muse. Double click on the MuseLab icon.

In the Opened Ports text box, enter the appropriate port. Select the appropriate protocol using the radio buttons and Click **Open Port**.

Configuration Control Ba	ar Visualizer
OSC	\$?
Incoming Ou	tgoing
Opened Ports	
5000 🔻	• ТСР
Open Port	
Incoming Messages	
Msg/Sec Address Pattern	Args Sender

You should see the incoming messages listed below a few seconds later.

Configuration Control Bar	Visual	izer
OSC	÷ (7
	•	
Incoming Outgoin	ng	
Opened Ports		
▼ ⊙	ТСР	
Open Port	UDP	
	001	
Incoming Messages		Come
Msg/Sec Address Pattern	Args	Senc
50 /muse/acc	fff	/12:
0 /muse/batt	iiii	/12:
1 /muse/config	S	/12:
9 /muse/drlref	ff	/12:
226 /muse/eeg	ffff	/12:
13 /muse/eeg/quantization	iiii	/12:
10 /muse/elements/alpha		/12:
11 /muse/elements/alpha	ffff	/12:
10 /muse/elements/alpha	ffff	/12:
10 /muse/elements/beta	ffff	/12:
11 /muse/elements/beta	ffff	/12:
10 /muse/elements/beta	ffff	/12:
11 /muse/elements/blink	i	/12:
10 /muse/elements/delta	ffff	/12:
11 /muse/elements/delta	ffff	/12:
10 /muse/elements/delta	ffff	/12
	Refres	sh 📄

Create a Scrolling Line Graph

Click on the dropdown menu in the sidebar and select Visualizers.

Click on New..., select Scrolling Line Graph, and click Finish.

Configuration	Control Bar	Visualizer	
Visualizers		\$?	
Select Visualizer:			
Displayed Visualizer	s	New	
		Remove	
New label			

The sidebar will then display a list of all the data streams available for plotting on this new graph.

splayed Visualizers		
rolling Line Graph		New
		Remove
		Iveniove
rolling Line Graph	Option	15
Signals	Settin	as Time
Cional Castions		
Signal Options		
	Draw	Colour
muse/acc/dropp		Khaki
muse/acc/raw (0)		Purple
muse/acc/raw (1)		Red
muse/acc/raw (2)		Salmon
muse/batt/raw (0)	- <u>H</u>	Green Yellow
muse/batt/raw (1)		Khaki
muse/batt/raw (2)		Light Blue
muse/batt/raw (3)		Light Cyan
muse/config/acc		Orange
muse/config/afe		Dark Khaki
muse/config/bat		Purple
muse/config/bat		Green
muse/config/bat		Fuchsia
muse/config/co		Salmon
muse/config/eeg		Yellow
Signal Group Optio		
	Draw	Colour
muse/eeg/quant		Light Cyan
muse/eeg/raw		Light Green
muse/acc/raw		Silver
muse/dsp/band		Dark Khaki
muse/dsp/band		Light Blue
muse/dsp/band		Purple

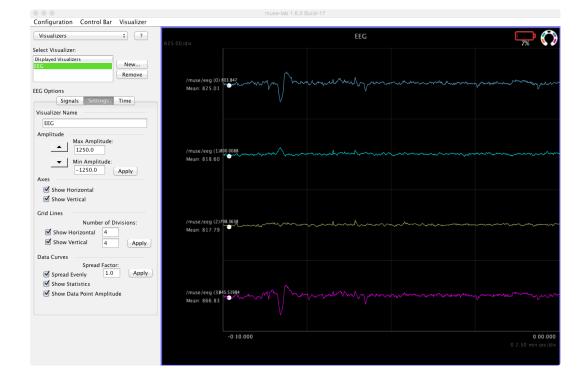
Click on **Settings** and change the name of the graph to **EEG**.

Scrolling	Line Graph	Options			
	Signals Settings Time				
Visualizer Name					
EEG					
Amplitude					
Max Amplitude:					

Add Muse data streams to the graph

In the Signal Group Options box, check the Draw box for /muse/eeg/raw.

Live EEG data will start to be plotted. Click on the plot area and use the up arrow key to zoom into the graph The default graph scale is zoomed far out, so the EEG data will look small at first. Note the occasional large spikes in the waveforms – those are blinks. Go ahead, try a blink or two!



Add graphs for accelerometer and alpha session scores

Now repeat the same process as above but with /muse/acc and /muse/elements/alpha_session_score:

- Create a new Scrolling Line Graph
- Rename it
- Add the appropriate data stream

Make sure to click on each graph and use the up/down arrows to scale it up or down to a point where you can easily see changes in it. For example, **/muse/elements/alpha_session_score** To play around with the session scores, try closing your eyes and relaxing for about ten seconds, then open your eyes. You should see the scores increase when you closed your eyes and decrease shortly after you opened them. ranges from 0 to 1, so make sure the scale (displayed in the top right corner of each graph) is appropriate (it starts way out at 5000 units/division).

You should end up with something like the example on the right.

🐵 🐵 muse-lab 1.6.3 Build-17				
Configuration Control Bar Visualizer				
Visualizers ‡ ?	312.50/div	EEG 📑 🔂		
Select Visualizer:	/muse/eeg (0)			
Displayed Visualizers Bis New Accelerometer Remove Alpha Session Scores Remove	Mean: 829.70 /muse/eeg(1) Mean: 828.98 /muse/eeg(2) Mean: 830.79			
Signals Settings Time	/muse/eeg (3)	an and the second se		
	Mean: 859.71			
Signal Options		-0:10.000 0:00.000		
	625.00/div	Accelerometer 0.2.50 min.sec/dw		
Orange Image Image Image Purple Image Image Image Red Image Image Image Light Cyan Image Image Image Dark Khaki Image Image Image Green Yellow Image Image Image Creen Yellow Image Image Image Light Crean Image Image Image Image Image Image Image	/muse/acc (0) Mean: -204.07			
Green Yellow Green Yellow Green Yellow Green Yellow Green Gr	/muse/acc (1) Mean: 956.82 /muse/acc (2)			
✓ Blue ✓ ✓ ✓ Cyan ✓ ✓	Mean: 264.48			
V Cyan V Dark Khaki ↓ V V Fuchsia ↓ V V Light Blue ↓ V V		-0:10.000 0:00.000 0.2.50 min sec/dw		
	1.22/div alpha_session_score (0)			
Signal Group Options	Mean: 0.43 -			
Draw Colour Zero Unifor Green : M	i/alpha_session_score (1) Mean: 0.36			
Creen Creen M M Light Green M M Salmon M M Cyan M M Khaki M M Orange M M	s/alpha_session_score (2) s/alpha_sessio n_900irQ-(3) Mean: 0.63			
	-	-0:10.000 0:00.000		

Record some data

Select **Recording** from the dropdown menu in the sidebar.

Choose a storage location and a filename and hit record. All the data from MuselO will be recorded, not just the data that you are plotting.

When you are finished recording, click Stop.

	muse-lab 1.6.3 Build-17		
Configuration Control Bar Visualizer			
Recording	Recording 312.50/div	EEG	2%
Recording Stop	/muse/eeg (0) Mean: 818.18	www.	······································
Elapsed Time: 0:12	/muse/eeg (1)	·····	······································
Location:	Mean: 832.52 /muse/eeg (2)	adagaget to an a factor and a factor of the second s	
/Applications/Muse/recordings	Mean: 827.82 /muse/eeg (3)		manufacture of the second s
Change	Mean: 865.48		
Filename:	-0:10.00	00	0:00.000
muselab_recording.muse	625.00/div	Accelerometer	0:2.50 min:sec/div
	/muse/acc (0)		
	Mean: -164.71		
	/muse/acc (1) Mean: 967.73		·
	/muse/acc (2) Mean: 258.20		
	-0:10.00	0	0:00.000
	-0.10.00		
	Alpha Session Scores		
	/alpha_session_score (0) Mean: 0.55		
	/alpha_session_score (1)		
	Mean: 0.24 /alpha_session_score (2)		
	i/alpha_session_score (3)		
	Mean: 0.71		
	-0:10.00	00	0:00.000

Convert your recording to a different file format

MuseLab records data in the .muse file format. To convert to a variety of other file formats or to replay Muse data from a recording over OSC to another program (say, to look at some data you recorded a while ago with MuseLab) you must use MusePlayer.

Open a Terminal or Command Prompt and enter the following command.

```
muse-player-f path/to/recording.muse -C recording.csv
```

For more information on how Muse data is stored, check out the File Formatssection.

Go forth and explore!

You now know everything you need to know to get started using the Muse Research Tools to experiment with Muse! Have at it!