

Congratulations on your purchase from Brain-Trainer. See instructions below or our <u>online guide</u> to proceed with installation for BioExplorer software. For Brain-Trainer for BioEra software, please see our <u>online setup guide</u>. Continue reading below for guidance on how to start training. For any questions email us at support@brain-trainer.com.

Setup

Step 1

BioExplorer software setup

Download and install the BioExplorer program.

Download BioExplorer version 1.7

This can be downloaded from your <u>Brain-Trainer account</u> or <u>CyberEvolution</u>*. Look at the USB dongle in your order to determine which version you should install based on its color.







"Green" license dongle

"Blue"/Purple license dongle

Purple license dongle key (blue)

Browse to the BE GreenDongleSetup (or BlueDongleSetup) file in the Downloads folder and run as Administrator (right-click for this option).



* Old 1 1/2" keys may only work with previous version of BE setup (BE1.7.0.661Setup). Contact Brain-Trainer.



Step 2

Connect the dongle key (BioExplorer will not run without it) and the amplifier (Optima+, Wiz, PhysioAmp) and wait for the computer to configure and install the devices.

Configuração do Disposit	ivo	×
Instalando disp	ositivo	
	Aguarde enquanto a Instalação instala os arquivos necessários no sistema. Isso pode levar alguns minutos.	
	Fecha	r

Step 3

Other software setup

Download any setup files from your links and run them. You may have any of the following:

Signature Software
Neurobit
Q-wiz
Designs
LIFE
TQ7
BxShadow/Silence Vision Gamer
Videos

Designs would be installed in the folder *Documents\BioExplorer\Designs*

Audio and videos would be installed in C:\ Program Files (x86)\BioExplorer\ Media

The TQ7 would be installed in *Documents\Brain-Trainer*

NOTE: You will find all manuals in the folder Documents\Brain-Trainer\Help



Step 4 (Optima+)

Enabling the Optima+

Turn the power on the Optima+

In the BioExplorer menu bar click on BioExplorer | Devices

	BioExplorer 1.0	6 [Des	ign -][S	essio	n - C	AP
E	BioExplorer	Edit	Session	Des	ign	0
6	Prefere	nces		-		
	Devices	i				
	Exit					



Click Add and select Neurobit Optima 4.

Click OK and Close

×	New Device
: Optima 4	Type: Neurobit Op
OK Cancel	
OK Cancel	

Click Optima Config Window

Device Properties	_	×
Settings	Optima Config Window	
ОК		lelp



Select Neurobit Optima+ 4 USB.



Enable each channel you will use (e.g. Chan A and Chan B for 2 channel EEG) and select settings for the type of training you will do. Close. Or click Load and choose the pre-set configuration file (in Documents\ Neurobit) for the type of training you want to do. Close.

Neurobit Optima+ 4 USB settings		Neurobit Optima+ 4 USB	settings	
General Chan A Chan B Chan C Ch	han D Chan E EEG Cap Test About	General Chan A Chan B	Chan C Chan D Chan E EEG Cap Test	About
Channel enable 🔽	>	Devic	e model Neurobit Optima+ 4 USB 💌	Device services
Channel label		L	ink type USB 💌	
Sensor info		D	evice id Neurobit Optima*	
Channel profile Use	ser defined	Load device configuration		
Channel function	/P	OO - 🖟 « My Docu	ments 🕨 Neurobit 🕨 👻 🍫	Search Neurobit 🔎
EM Em	AG G	Organize 🔻 New folde	er	iii 🕶 🔟 🔞
Manuament same (u)	G 250sps DG	A 🛠 Favorites	Documents library	Arrange by: Folder 🔻
	R HEG	Downloads =	Name	Date modified
Range minimum [uV] RES	SP belt	Recent Places	🕌 Manuals	10/25/2018 8:03
Sample rate [sps]	MP	ConeDrive	NO settings	11/6/2018 11:28
Lower limit frequency [Hz] 0.5	5	Media	EEG 2C (I) Independent.nbc	10/23/2018 7:39
Power interference filter 🔽		ShareFile	EEG 2C (L) Linked.nbc	10/23/2018 7:38
		🛟 Dropbox	HEG nIR.nbc	10/23/2018 7:34
Sum disconnected		4 🥽 Libraries 🔻	•	Þ
Common reference No	o connection	File n	ame: HEG nIR.nbc 🔹	Device settings files 🔹
EEG cap connection No	one y			Open 😽 Cancel
Load Save	<u>Close</u> <u>N</u> ext	Load	Save	<u>C</u> lose <u>N</u> ext

If the status shown is CONNECTING... disconnect Optima+ from the USB port and re-connect.

Neurobit Optima 4	CONNECTED

Neurobit Driver and associated runtime files are included as part of the brain-trainer Neurobit_Setup file. However, new versions of that runtime package may be released independently of the application releases. The latest package is always available on the webpage:

http://www.neurobitsystems.com/download/Neurobit_Runtime-versions.htm

Unpack it (Extract files) (with enabled overwriting of existing files) to C:\Program Files (x86)\BioExplorer.



Step 4 (Q-wiz)

Enabling the Q-wiz

In the BioExplorer menu bar click on BioExplorer | Devices ...

BioExplorer 1.6 [Design -] [Session - CAP BioExplorer Edit Session Design O Preferences... Devices... Exit



Select PN Wiz

Device			Status		
	New Device			×	
	Type: PN Wiz				
		OK	Can	cel	

Select the port

Device Properties	
Serial Port Monitor PN Wiz	
Port COM3 Baud Rate 23400	
Parity None 💌	
Byte Size 8	
Stop Bits 1	

If a port does not appear then your Q-wiz was not recognized by the computer. Try to put it on another port and wait for it to install.



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×
Status
Connecting
connecta igni

If Status CONNECTING appears, remove the Q-wiz cable from the USB port and connect again.

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You will know that your Q-wiz is connected correctly when the above status appears as CONNECTED.



Step 5

BioExplorer settings

In the menu bar select BioExplorer | Preferences



In the General tab you may select any or all of the top 4 options.

Preferences Properties
General Device Data Audio Video DVD Settings Emotiv
 Reload last design at startup Get Timer Settings from Design
Record on Play
Play Immediately
Prompt for Session Info when Recording
Auto Generate Session Filename
Save session files here when auto-generating filename:
E:\My Documents\BioExplorer\Sessions Browse
Default
OK Cancel Apply Help

If you plan to use DVDs in BioExplorer, on the DVD Settings tab select DScaler as decoder option for Video and Audio.

Preferences Prope	rties	X
General Device	Data Audio Video DVD Settings Emotiv	
Navigator:	DVD Navigator	
Video Decoder:	DScaler Mpeg2 Video Decoder version 0.0.6.0	
Audio Decoder:	DScaler Audio Decoder version 0.0.8.0	
	Direct Connect to Renderers	
	OK Cancel Apply H	lelp



In the menu bar, select Session | Timer. Under Timeout Sound click the ... button and browse to the folder C:\Program Files (x86)\BioExplorer\ Media to select the ding or chimes file.

Session Timer			
▼ Time Session 00:10:00	•		
On Timeout			
Timeout Sound chimes.wav			
Play Sound			
OK Cancel Help			



Learning about Brain-Training

Watch Informational Videos

Learn BioExplorer Basics

Finding Sites Video-Lesson I (if purchased). Included in Foundations of Brain-Training.

Placing Electrodes Video - Lesson II (if purchased). Included in Foundations of Brain-Training.

About Snap-In Disposable Electrodes

Signal Quality - Recognizing artifact

Using the Electro-Cap

Get Whole-Brain Training Plan

- 1. Complete <u>Client Report</u> Forms
- 2. Complete Assessment recordings
- 3. *If you purchased the WHOLE-BRAIN TRAINING PLAN Service* -- *Email Reports, epochs, sessions to pvdtlc@gmail.com* or
- 3. If you purchased the TQ7 Trainer's Q -- Process Data in TQ7 Trainer's Q, see How To below.

Online <u>Consulting</u> and Webinars are available

Further Information

Next Level Training Videos (if purchased)

TQ7 Trainer's Q How To (playlist)

<u>Whole-Brain Training Videos</u> - Training plan, Design package, Design options, Coherence, LIFE, Cap override, Snap-in electrodes

More Feedback Options - Videos, BxShadow, NeuroPuzzles, Somatic Vision

BioExplorer Tips - Interface, managing windows, session timer, devices, preferences

Search topics or do independent study in the Brain-Trainer Answers pages

Ask questions on the Brain-Trainer IO Groups list

Watch more videos on our YouTube channel



Getting Started with EEG Brain Training

Peter Van Deusen, President, Brain-Trainer International, Inc.

Recommendations for getting started:

- 1. Plan to train yourself first. As perfect as your brain may be, there is no substitute for the experience of sitting in the client chair and actually feeling how training works and how it helps you change yourself. If your intent is to offer training to a friend or family member, doing it yourself and making your own changes in a great way to motivate your client as well.
- 2. It's not absolutely required but strongly recommended that you find a "buddy" or a few (including your client, if appropriate). Just like starting any new exercise program to change your life, working with someone speeds the learning and helps keep you motivated until you actually start seeing results. Share and discuss the book A Symphony in the Brain by Tom Robbins, and you should find plenty of folks who are interested.
- 3. Get training on finding sites and placing electrodes (see the <u>Brain-Trainer Skills Video</u> <u>Workshops</u> at brain-trainer.com). Spend an hour or two practicing these (learn to find sites even before you have all your equipment). These skills are crucial. Without them you will never get your best results. You won't consistently be training the proper areas and the real brain activity. The map of the sites on the head is not a good alternative unless you believe that could drive to Akron, OH by looking at a US topographical map.
- 4. When the equipment arrives, follow this guide to get everything installed. It usually takes an hour or so.

If you got the snap-in electrode set, you will have received 5 or 10 electrode wires with snap-in heads. You can try to match wire colors to plug colors if you wish, but it's not necessary. The colors of wires simply help you trace which site on the head is going to which input on the amplifier.

There are 3 types of snap-ins:

- a. Round adhesive snap-ins which are for single use on areas without hair (e.g. back of the neck for ground, behind the ears on the mastoid bone for references
- b. Square adhesive snap-ins which are for the same use as the round ones. You may prefer one or the other and when re-supplying you can choose the type you want.
- c. Blue plastic "Neurotrodes" with a white plastic covering over their metal center and some paste already on them. You will use a small mound of paste over the center of these and place them over prepped spots where you have cleared hair from the scalp. Each can be used 6-12 times until the plastic cover comes off and the dark center starts to turn silver. Replace all of the ones you are using at the same time.

Using mostly 2-channel montages, you will use 3 adhesives and 2 Neurotrodes for a connection. In a 1-channel montage, you'll use 2 adhesives and one Neurotrode. The starter kit should last you for at least 100-120 sessions.

- 5. When you have things set up, and you've worked some on site-finding, it's time to learn about Montages. Look at the amplifier, and you'll see that the inputs to plug the electrodes into are marked 1+, 1-, or A+, A-, etc. Each channel of EEG (you can train one-channel, two-channel, 3 or 4-channels at a time) has:
 - a. One "active" electrode (which goes into the + input)





- b. One "reference" electrode (which goes into the input
- c. A Ground or neutral electrode (which goes into the G or N input)

The "montage" listing shows you which sites on the head go to which inputs in each channel. For example: C3/A1 means that C3 on the head plugs into the 1+ input and A1 plugs into the 1input. You MUST have a ground (most amplifiers use one ground for all channels), and the ground can go anywhere on the body. It may or may not be specified in the Montage.

You MUST use conductant on the ground and ears (paste, gel, etc.).

C3 C4 (A1 A2) means that C3 goes into 1+ and C4 goes into 2+, A1 and A2 go into the 1- and 2- inputs and the ground can be placed anywhere.

- 6. Spend an hour or so to practice doing hookups with your buddies in 1 channel, using the montage Fp1 A1 G(A2). Put the active electrode on the forehead and the reference and ground on the earlobes or mastoid. Learn to get clean connections first WITHOUT having to deal with hair. To test your connections:
- 7. Open BioExplorer, load a Design like Sample Session and record a couple minutes of data. Pay attention to the spectrum analyzer and oscilloscope displays.
 - a. The spectrum analyzer should be set to show to 60Hz. Especially look for very tall bars at 50 or 60 that don't seem to change much or for very tall spikes that occur at regular intervals on the spectrum. These are indications of electromagnetic artifact—electrical environmental noise masquerading as EEG.
 - b. The oscilloscope should show a waveform with a variety of amplitudes (heights) and a variety of widths (frequencies). The more regular and consistent it is, the more likely it is not coming from the brain. Sharper wave tops and bottoms are more likely artifact than rounded ones.
 - c. Send those files to <u>Karen</u> Or <u>Pete</u> for feedback on signal quality and potential problems.
- 8. When you are getting good signals, repeat steps 4 and 5 placing your active electrode over a site on the head with hair around it. When you get good signals in one channel, try 2 channels. In two channels, look for symmetry in the two sides of the spectrum analyzer.
- 9. Have an assessment party: Get a couple interested friends/colleagues to come spend a few hours taking turns doing the assessment (someone as the client, someone reading instructions and someone being the trainer). Repeat the process, switching roles, so you complete 2-3 assessments and the process becomes routine. Again, send Karen or Pete those files for feedback. Don't expect these first runs will be much good, but as an exercise in finding sites and placing electrodes and going through the steps, they are invaluable.
- 10. If it looks like you are succeeding in getting good data, and the process feels pretty routine, go ahead and do (with your helpers) "real" assessments to submit. Make sure to complete the Client Report for each. Send the "real" assessments to Brain-Trainer for processing. https://brain-trainer.com/product/whole-brain-training-plan/
- 11. You'll get training plan(s) back for the assessments you ordered. You can also request (at least for the first few) that we schedule time online to review the assessment with you and show you how to use any of the suggested designs that are new to you. Then you begin testing them



by placing the electrodes where indicated and running the indicated protocols. You test each of the options once and decide, based on the client's response, which ones to focus on.

12. Supervision/consultation can be scheduled by the hour or in a package. <u>https://brain-trainer.com/product-category/consultation/online-consultation-mentoring/</u>

Depending on people's schedules, you could complete steps 1-4 within 7-10 days (or faster) starting over one weekend and finishing over the next. Then you'd be ready to start training 1 (yourself) to 3 people. When you have been involved in training 3 people from assessment to an end point, you will truly understand the training process!

Terminology for Sensor Connection

Montages:

Active and Reference electrodes provide EEG measurement (active or inert sites)

Measure signal BETWEEN the two sites, subtracting one from the other.

Ground electrode closes the circuit-DOESN'T MEASURE EEG! Can be set anywhere. Always use a ground!

Monopolar (referential) montage= One electrode over active site, other over "inert" site (mastoid or ear lobe)

Bipolar (sequential) montage= Both electrodes over active sites as in C3 C4 (always use a ground)

Each set of active and reference electrodes represent one channel of EEG.

On the Q-wiz, Channel 3 and Channel 4 share the reference with Channel 1 and Channel 2. On the Optima+ 4, each channel can have its own reference.

Montages and Protocols

Frequency (number of pulses a neuron fires each second); measured in Hertz (Hz)

One Hz equals one pulse per second.

Amplitude (energy differential between Active and Reference lead in a frequency band); measured in Microvolts (uV). One uV is one millionth of a volt.

A. EEG readings are actually differences between two points read against a "ground".

- 1. The difference in electrical activity is measured BETWEEN the two sites.
- 2. Activity found at both sites cancels out; this is called "common-mode rejection"
- 3. Ground may be any point on the body, even an active EEG site.
- 4. Brain-Trainer's Whole-Brain Training Plan will list protocols as follows:

Active (+) Reference (-) (always use a ground, anywhere on body)

<u>C4 A2</u>

- B. Monopolar (single-point) montages read an active EEG site against an "inert" site
 - 1. Inert sites, with little readable brain activity, include ear lobes and mastoid



2. Examples of "monopolar" montages would be:

<u>Cz A2; C4 Pz; T3 T4.</u>

- 3. Note: the Reference lead should generally be on the same side as the Active.
- 4. These are supposed to train a specific site by itself (Cz, C4 or T3)

5. In reality, they measure activity from the entire head, though signal tends to be dominated by activity near the active lead.

- C. Bipolar (two-point) montages read one active EEG site against another.
 - 1. Mirror sites (e.g. <u>C3 C4</u>; <u>T3 T4</u>; <u>F7 F8</u>) link the hemispheres.
 - 2. Intra-hemispheric sites (e.g. <u>F3 P3</u>; <u>C4 T4</u>) train linked locations on one side.
- D. One- vs. Two-Channel Montages
 - 1. Two channel training requires a machine capable of tracking separate channels
 - 2. Each channel has its own Active lead wire, may share Reference, shares Ground lead.
 - 3. Each channel may train same or separate protocols.
 - 4. Two-channel training allows double the effect in a given period.
 - 5. Some argue it teaches the brain to do multiple things at same time.
 - 6. Avoids the need to titrate different frequency training.

References

L means Linked : Linked references, where the two references are plugged into the two - inputs on the amplifier and linking is engaged ("Link" button on Q-wiz, Common reference "Internal connection" on Optima+, use of "jumper" on other amplifiers), so they are averaged to give the same signal for both references. For example:

P3 P4 L(A1 A2) (always use a ground)

C means **Common**: Common references are where both actives link to the SAME reference. C references are LINKED. For example:

<u>C3</u> P3 <u>C(A1)</u> (always use a ground) Both sites are using A1 as their reference. By pressing the *Link* button, you can plug a single electrode into either end of the reference plug, and it will serve for both channels, leaving the 2nd reference empty.

I means **Independent**: Independent references (are NOT linked), where each active electrode is measured in relation to its own reference. A classic example of this is:

<u>C3</u> C4 I(A1 A2) (always use a ground) C3 links to A1 and C4 links to A2.



Frequencies and States

Frequencies are measures of the firing speed (pulse speed) of neurons/networks. They are measured in pulses per second. One pulse per second is one Hertz (Hz).



SLOW FREQUENCIES

Processing speeds; Locus of awareness primarily internal; image-based processing Creative-intuitive thought; flash-thinking, leaps to conclusions.

DELTA (0.5-3.0 or 0-4Hz)

Primarily found during deep sleep; high waking levels can indicate a lesion Importance of 3Hz surges: old emotional trauma.

THETA (3-7 or 4-8Hz)

Normally seen during hynogogic states (waking up/falling asleep) "Good" theta vs. "Bad" theta. Importance of 7Hz activity: memory consolidation, integration of material.

MIDDLE FREQUENCIES

Awareness speeds; no processing; no thought; stillness.

ALPHA (8-11 or 8-12Hz) Mental stillness; pure awareness without processing; should center on 10Hz for adults; slower speeds used for visualization; auto-pilot state; resting state. Importance of 10Hz activity: primary attractor for adult brains.



SMR/LoBETA (12-15 or 12-16Hz)

Physical stillness; body presence; often heavy and warm feelings; low muscle tone; Importance of 14 Hz activity in circadian rhythms, sleep onset, screening.

FAST FREQUENCIES

Processing speeds; internal or external locus of awareness; language processing; Logical-rational thought; processing in sequences and hierarchies.

BETA (15-18 or 16-20Hz) Detail-oriented processing. Calculation and extraction of meaning.

BETA2 (19-22 or 20-24Hz) Extreme engagement, highly focused, curious; may be experienced as anxious.

HIBETA (23-38 Hz) Hyper-vigilance; extreme anxiety; generally relates to PTSD or abuse history

GAMMA (38-40Hz) 40Hz: Shear frequency; integrative/binding frequency found in all areas of brain.



10 / 20 System Electrode Distances

