

Training: The Electro-Cap

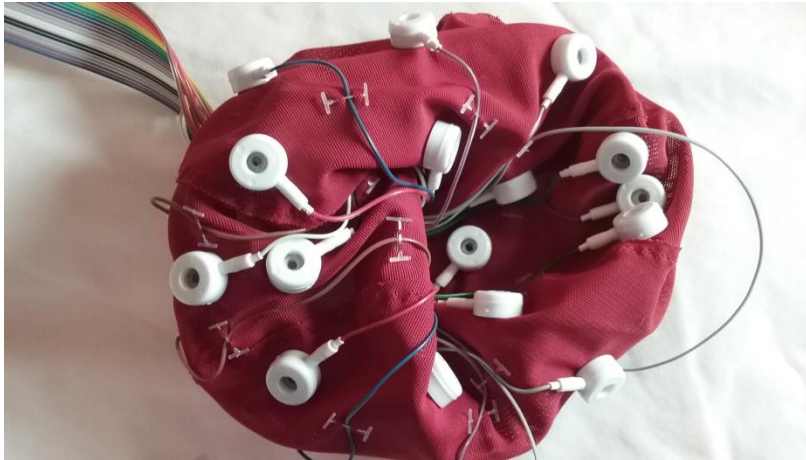
Neurobit Optima+ 4 USB

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About the Electro-Cap

Electrodes



Tin electrodes are fastened into the cap and their connecting wires are tacked into it with plastic fasteners. Leave these fasteners in place. The colored wires deliver the signal to the amplifier. Please be very cautious not to stress the wires and thus disrupt the signal flowing through them.

Ear Electrodes



Newer caps will use long, tin ear clip electrodes that clip on the ear and plug into the amplifier (e.g. A-, B-).

Older caps will have ear drop wires hanging down from the cap. Short ear drop clip electrodes can be plugged into them and connected to the ear lobes. When the ear drops are plugged into the cap ear drop wires, the signal will be sent

from the ear lobes, through the cap ribbon wires to the amplifier as the reference signal (-). Colors do not matter.

Left ear clip- A1- is default reference for channels 1 and 3. Right ear clip- A2- is default reference for channels 2 and 4. *When using with the Optima+, ear drop references are always linked.* For this reason, we recommend long, tin ear clip electrodes connected from the ear lobes to the Optima+, not connected to the cap so that independent references can be used when necessary.



Connection



The wires from all the electrodes go from the cap to the connector end in a multicolored group. Leave these wires connected to reduce signal interference.

The connector end plugs into the amplifier. If it is not plugged in, the signal cannot get to your amplifier. If your amplifier does not have a cap connection, you will need an adaptor that will connect to the cap connector

and allow you to plug in single electrode wires to your amplifier as needed.

Quick Insert Electrodes



Quick Insert electrodes are provided so that when a site is required that is not accessible in the software settings, the cap's default channel can be overridden. The wire is connected to the sensor on the cap and plugged into the amplifier for that channel (e.g. A+, B+).

Electro-Gel

Please use *Electro-Gel* and only Electro-Gel on the cap electrodes. (*NUPREP* IS NOT A CONDUCTANT; IT IS AN ABRASIVE AND WILL NOT WORK FOR THE CAP!). Gel conducts the signal from the scalp to the amplifier and must be used on all sensors used in a session.

Needle/Syringe Kit

The needle attaches to the syringe to draw the conductive gel into it to be applied to the cap's sensors through the holes.



How to Use the Cap



Please watch the video at this link before you begin:

Using the Electro-Cap: <https://youtu.be/hihgD2c8DnQ>

Cleaning the Electro-Cap



See this video to show how to clean your cap after each use:

Cleaning the Electro-Cap: <https://youtu.be/5wHM0Q10ZSg>

Whole-Brain Training with the Electro-Cap



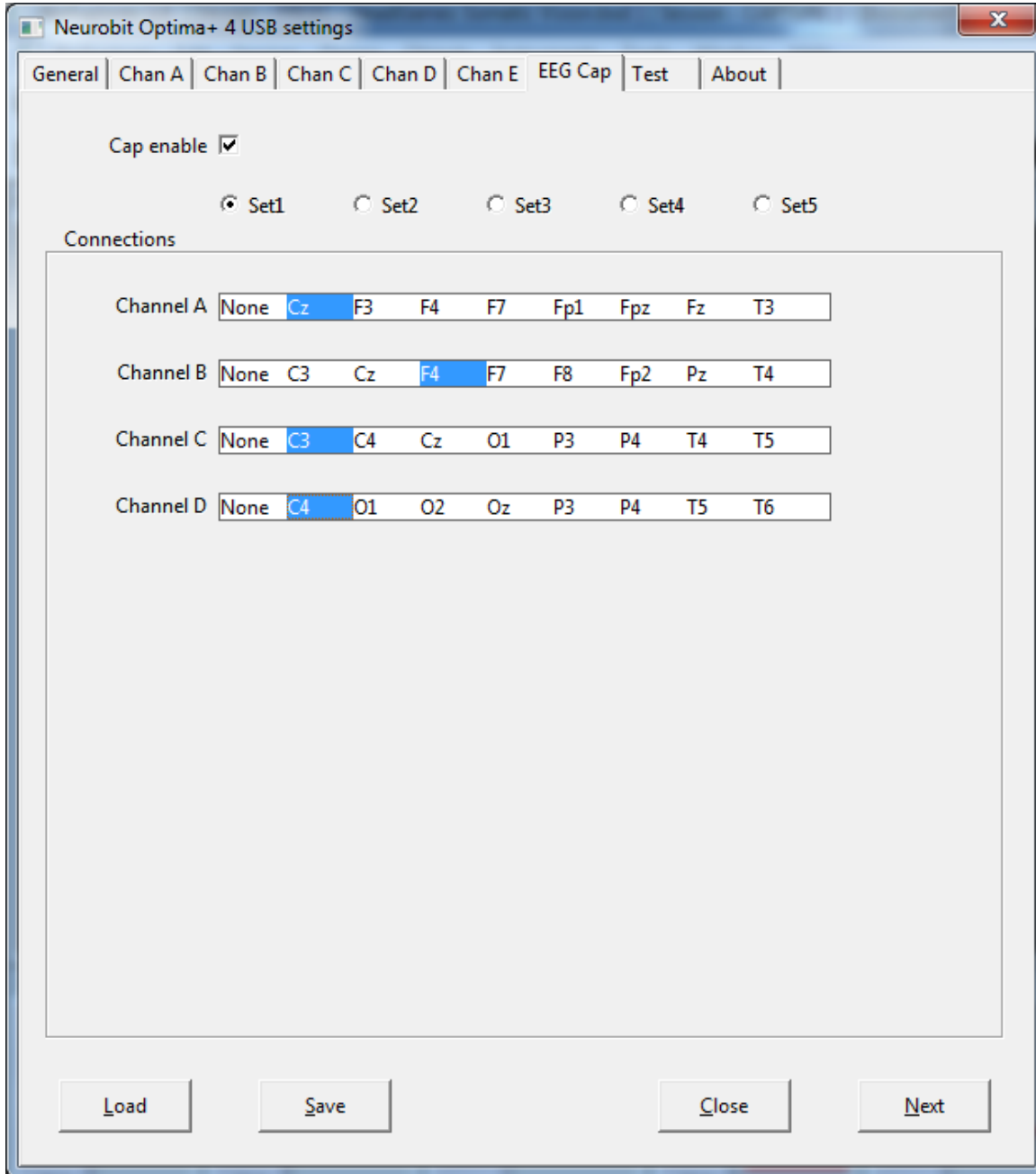
Before you begin your Whole-Brain Training plan, be sure you have seen the video showing how to use Quick Insert electrodes:

Electro-Cap Override: <https://youtu.be/xiHplZJ32b4>

Neurobit Optima+ 4 USB Controlling Cap Electrode details:

All placements listed under the "Active" column in the Whole-Brain training plan are to be selected in the slots A-D in the Optima Settings window in the order they are listed. If the actives are listed as "F3 F4 C3 C4" click on the slots in the order listed. Select only one site per slot.

If a site is not listed, you can connect a Quick Insert electrode from the cap site to the channel port on the Optima to override the cap (See "[Understanding default Settings](#)").



Neurobit Optima+ 4 USB settings

General | Chan A | Chan B | Chan C | Chan D | Chan E | EEG Cap | Test | About

Cap enable ☒

☒ Set1 ☐ Set2 ☐ Set3 ☐ Set4 ☐ Set5

Connections

Channel A	None	Cz	F3	F4	F7	Fp1	Fpz	Fz	T3
Channel B	None	C3	Cz	F4	F7	F8	Fp2	Pz	T4
Channel C	None	C3	C4	Cz	O1	P3	P4	T4	T5
Channel D	None	C4	O1	O2	Oz	P3	P4	T5	T6

Load Save Close Next

Understanding Default Settings

When recommended placements are not available in the slots of the Settings window

Not all sites will be shown for each channel in the Optima Settings window. If the placements required in each channel do not meet the sites available in each slot then you will use a Quick Insert electrode for any channel directed in the video below.



Overriding the cap: <https://youtu.be/xiHplZJ32b4>

The references are listed under the "Reference" column in the *Whole-Brain training plan*. In some training the Reference column suggests A1 A2 (ear lobes). A1 (left ear) for CH1 and CH3 and A2 (right ear) for CH2 and CH 4.

If A1 and A2 are not listed as references then you will use a Quick Insert (QI) electrode connected to the reference site on the cap and plug it into the -A or -B on Optima+. Make sure that no ear clip is attached to any cap ear drop wire.

The ground is ALWAYS to be used and gelled. It is at AFZ by default (the top of the "triangle" on the forehead, above Fp1 and Fp2). If using a Quick Insert electrode for the ground, it can be at any site on the cap as long as you plug it into the white VG ground port on the Optima+.



REFERENCES – To Link or Not to Link

(L) = use Internal connection

(C) = use Internal connection

(I) = use No connection

1-channel montages = either Internal connection or No connection will work

Indicators under the reference column: L, C, and I

L means Linked : Linked references are linked, when the two references are plugged into the two reference inputs and **Internal connection** is on so they are averaged to give the same signal for both references.

C means Common: Common references are when both actives use the SAME single reference. Common reference uses **Internal connection** on the Optima+. For example, C3 P3 C (A1). Both sites are using A1 as their reference. By connecting, you can plug a single electrode into either reference plug, and it will serve for both channels.

I means Independent: Independent references are NOT linked, when each active electrode is measured in relation to its own reference. A classic example of this C3 C4 I(A1 A2) FRE2C Beta/SMR training: C3 references to A1 and C4 references to A2. Use **No connection** in settings.

If you are using a 1 channel protocol and A2 is the reference then you will need to connect the A2 reference electrode to the Optima in the A- reference port.

Optima+

When using the Optima+ *and* the cap is enabled on the EEG Cap tab, "Internal connection" is set by default. The cap's ear drop references are *always* linked and linking cannot be turned off to the ear drops. (Newer caps will not have ear drop wires.) For this reason we use separate long tin ear clip electrodes for ear references. If you do not have them, you can do any linked/common reference montage training and any 1-channel training but not independent reference montages.

To use *independent references*, connect gelled, long, tin ear clips to the ear lobes and to the amplifier reference ports (e.g. -A, -B). **You would not connect ear clips to the cap.** Connection setting should have "No connection" selected. For your convenience, you can load pre-set settings for Electro-Cap (I) Independent or (L) Linked as required. These are located in Documents\Neurobit if you have run a Brain-Trainer Optima setup file.

Cap and Electrode Signal Troubleshooting:

- Re-gel certain locations. Pay special attention to the ground and reference locations.
- Make sure your computer plug has 3 prongs. If not, run it on battery during sessions.
- Make sure there are no power strips next the computer and that you are not sitting close to a wall with an outlet.
- Make sure the rainbow cord from the cap is not touching other wires or anything metal around the room, like metal on the chair.
- Place the amplifier on your lap.
- Using Nuprep on the ear lobes before adding gelled ear clips can help.
- Make sure all sites are connecting to the scalp. Try pulling the cap down as low as possible to make flush connections.
- Use a sponge disc under areas that seem like there is less contact. Sometimes those areas can be Oz, Cz, Pz, T3 T4 ,F7 F8.