

# Optima+ 4 USB Settings in BioExplorer

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## REFERENCES – To Link or Not to Link

*(L) = use Internal connection*

*(C) = use Internal connection*

*A2 with Electro-Cap ear drop clips = 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.

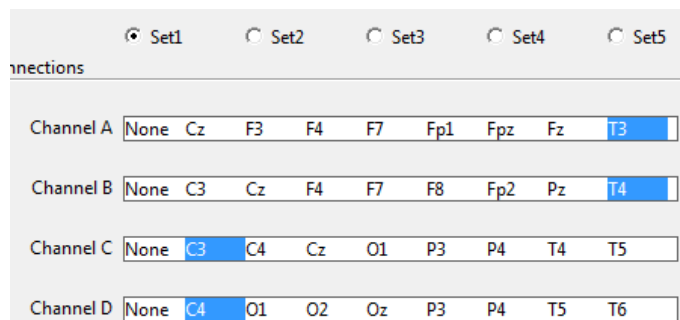
If you are using the Electro-Cap ear drop clips for a 1 channel protocol and A2 is the reference then you will need to connect the A2 reference electrode to the Optima in the A- reference port.

## HEG LIFE

1. Connect headband to Optima+.
2. Press on/off button to power on the Optima+
3. Open design : **HEG LIFE Optima nIR\_v1.7.bxd**
4. Right click on “Neurobit Optima 4” in top status bar | Properties
5. Click “Optima Config Window”
6. Click “LOAD” (at bottom left)
7. In *Documents\Neurobit* folder choose: “**HEG nIR.nbc**”
8. Click: "OPEN"
9. Click “CLOSE” and “OK”
10. Start session

## TQ Assessment

1. Open design : **TQ Assess Pro Gather 4C**
2. Right click on “Neurobit Optima 4” in top status bar | Properties
3. Click “Optima Config Window”
4. Click “LOAD” (at bottom left)
5. In *Documents\Neurobit* folder choose “**EEG 4C (L) Linked.nbc**” for electrodes, “**Electro-Cap TQ7 Assess.nbc**” for Electro-Cap.
6. Click: "OPEN"
7. Site selection
  - a. **Electrodes:** Click "CLOSE" and "OK" and plug electrodes at sites T3 T4 C3 C4 into Channel ports A+, B+, C+, D+, ear clips into A-, B- and ground into white VG ground plug on the Optima.
  - b. **Electro-Cap:** Click “EEG Cap” tab at the top  
(Default cap settings: AFz is ground, A1 A2 are references. You can use the long ear clips connected to A- and B- on the Optima+)
    - i. Select sites to record. “Cap Enable” box should already be checked.
      1. Click “Set1” to enable T3 T4 C3 C4
      2. Click “Set2” to enable F3 F4 P3 P4
      3. Click “Set3” to enable Fz Pz Cz Oz
      4. Click “Set4” to enable F7 F8 T5 T6
      5. Click “Set5” to enable Fp1 Fp2 O1 O2
    - ii. Click “CLOSE” and “OK” after each step
8. Start recordings



## 4 Channel session

Protocol example: **BAL4C RH Bipolar** C4 Fp2 T3 P4 C(T4)

1. Open design: **BAL4C RH Bipolar**
2. Right click on “Neurobit Optima 4” in top status bar | Properties
3. Click “Optima Config Window”
4. Click “LOAD” (at bottom left)
5. In *Documents\Neurobit* folder choose “**EEG 4C (L) Linked.nbc**” for electrodes, “**Electro-Cap 4C (L) Linked.nbc**” for Electro-Cap
6. Click: "OPEN"
7. Site selection
  - a. **Electrodes:** Click "CLOSE" and "OK" and plug electrodes at sites C4 Fp2 T3 P4 into Channels A+, B+, C+, D+ and T4 into A- and ground into white VG ground on the Optima+
  - b. **Electro-Cap:** Click “EEG Cap” tab at the top  
(Default cap settings: AFz is ground, A1 A2 are linked references. Unplug ear clips from cap's drop wires, if there, when not using the ear as reference.)
    - i. Select sites to train. “Cap Enable” box should be checked.
      1. Channel A: There is no C4. Leave at NONE- **Use a Quick Insert** into C4 on the cap and A+ on the Optima+
      2. Channel B: Click on Fp2
      3. Channel C: There is no T3. Leave at NONE- **Use a Quick Insert** into T3 on the cap and C+ on the Optima+
      4. Channel D: Click on P4
    - ii. Reference
      1. T4 reference: (unplug A1 A2 from cap drop wires if there). **Use a Quick Insert** electrode into T4 on the cap and channel A- on the Optima+.
      2. For protocols using A1 and A2 as references, you can use long *tin* ear clips connected to A- and B- on the Optima+. Alternatively, you can use short ear clips connected to the cap's ear drop wires *for linked references only*.
    - iii. Click “CLOSE” and “OK”
8. Start session

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

## 2 Channel Session

Protocol example: **FRE2C** T3 T4 L(A1 A2) or **FRE2C Beta SMR** C3 C4 I(A1 A2)

1. Open design: **FRE2C** or **FRE2C Beta**
2. Right click on “Neurobit Optima 4” in top status bar | Properties
3. Click “Optima Config Window”
4. Click “LOAD” (at bottom left)
5. In *Documents\Neurobit* folder choose:
  - a. For electrodes “**EEG 2C (L) Linked.nbc**” (for linked (L) or common (C) reference) OR “**EEG 2C (I) Independent.nbc**” (for independent (I) reference);
  - b. For Electro-Cap “**Electro-Cap 2C (L) Linked.nbc**” (for linked (L) or common (C) reference) OR “**Electro-Cap 2C (I) Independent.nbc**” (for independent (I) reference).
6. Click: "OPEN"
7. Site selection
  - a. **Electrodes:** Click "CLOSE" and "OK" and plug electrodes at scalp sites into Channels A+, B+, ear clips into A-, B- and ground into white VG ground plug on the Optima+.
  - b. **Electro-Cap:** Click “EEG Cap” tab at the top  
(Default cap settings: AFz is ground, A1 A2 are linked references. Unplug ear clips from cap's drop wires, if there, when not using the ear as reference.)
    - i. Select sites to train. “Cap Enable” box should be checked.
      1. Choose placements in Channel A and Channel B.
      2. If placements are not in the channel A and B slots **use Quick Inserts**.
      3. Leave Channels C and D at NONE because you are only using 2 channels.
    - ii. Reference  
  
Use long *tin* ear clips connected to A- and B- on the Optima+. Alternatively, you can use short ear clips connected to the cap's ear drop wires *for linked (L) references only*.
    - iii. Click “CLOSE” and “OK”
8. Start session

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

## 1 Channel session

Protocol example: **SMR%1C** C3 (C4)

1. Open design: **SMR%1C**
2. Right click on “Neurobit Optima 4” in top status bar | Properties
3. Click “Optima Config Window”
4. Click “LOAD” (at bottom left)
5. In *Documents\Neurobit* folder choose: “**EEG 1C.nbc**” for electrodes, “**Electro-Cap 1C.nbc**” for Electro-Cap
6. Click: "OPEN"
7. Site selection
  - a. **Electrodes:** Click “CLOSE” and “OK” and plug electrode at C3 into A+ and at C4 into A- and ground into white VG ground plug on the Optima+.
  - b. **Electro-Cap:** Click “EEG Cap” tab at the top to select sites.

(Default cap settings: AFz is ground. Ear electrode is not used for C4 reference. Unplug ear clips from cap's ear drop wires when not using an ear reference.)

    - i. Select sites to train. “Cap Enable” box should already be checked.
      1. Channel A: There is no C3. Leave at NONE. **Use a Quick Insert** into C3 on the cap and A+ in Optima+.
      2. Leave B , C, D at NONE because you are not using B, C, D
    - ii. Reference
      1. **Use a Quick Insert** into C4 on the cap and A- on the Optima+ for reference.
      2. Click “CLOSE” and “OK”
      3. In protocols using an ear reference, you can use a long *tin* ear clip electrode connected to the ear and to A- on the Optima+.
8. Start session

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