



eBioo[®] Version 2.0 Neurofeedback Software

Extract of Manual only !

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eBioo[®] Neurofeedback Software

Windows[®] XP, 7, , 8 and 10 - 32 and 64 Bit (WoW)

October 2021

Quick Install Guide

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User Manual[©]

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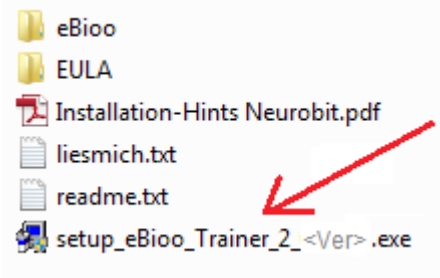
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Quick Install Guide

Installation and Setup Instructions

1. Installation

eBIOO 2.0 Versions (STARTER, Tuner and Trainer) are delivered on CD. The CD has the following files and directories in the root directory (example):



Use the **setup_eBIOO*.exe** to install the software onto your computer. The setup will create appropriate registry entries and create an eBIOO desktop icon onto the computer desktop.

On the other hand, experienced users can copy the entire eBIOO sub-directory onto the computer hard disk drive and create a desktop icon manually, targeting to the eBIOO*.exe file. In that case, no registry entry is done.

For detailed information see document:

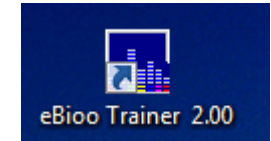
Installation-Hints <DeviceManufacturerName>.PDF on CD.

Or send an eMail to Soft-dynamics.com to get that PDF.document.

2. Connecting the EEG-Hardware Device

The installation routine has added an eBIOO shortcut on your Computer Desktop.

Start eBIOO e. g. using this shortcut:



To start eBIOO 2.0 the eBIOO HASP Security-Dongle has to be present in one of the USB ports:



2.A Devices connecting via Bluetooth or USB

Devices of Neurobit Systems:

A Device of Neurobit systems is connected to the computer via Bluetooth or USB cable (Plug&Play).

See document: **Installation-Hints Neurobit.pdf** (on CD)
and **the Neurobit Manual**
and **eBIOO - Options – Data Source**

for details.

(see next page)

7. Start Data Processing



Start the data processing using the arrow right button on top of the main screen or press the [F4] key or select menu item "Session - START Data Processing".

Moving the mouse cursor onto the raw data screen, the data acquisition processing is traced in the status line at the bottom on the main screen.

8. Hints and special Features

a) EEG-Signal / Raw Data Screen

The raw data screen is located at the left upper corner of the main screen.

The amplitude scaling can be modified executing a right mouse click on the raw data screen. A pop up menu will appear to select the data range.

Moving the cursor to the right border of the raw data screen will let pop up a slider that allows to adjust the duration of one depicted raw data line.

b) Spectrum Screen

The spectrum screen is at the left bottom corner of the main screen.

A RIGHT MOUSE CLICK onto the spectrum screen will let pop up a menu to offer a quick function, channel and layout modification menu of frequently used options.

Frequency Axis Upright	Amplitude
Column Color : unique	rel.Amplitude
Spectrum upsideDown: ON	Asymmetrie
Frequency Skala linear	rel.Asymmetrie
Column Width static	Channel Average
Tile Gap: OFF	Coherence
Column Gap: OFF	more Functions

Moving the mouse button on the spectrum screen will show some additional information in the status line at the bottom.

Alpha	Col: 70 A: 44,5 % F: 11,0 Hz	3 Waves : delta t= 0,3 Sec. delta f= 3,7 Hz	Screen 1 : Amplitude = A (ch,col) [uV]
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The display function, that has been selected in the popUp-Menu will be assigned to the sub-screen where the mouse cursor is positioned. The sub-screen number is shown in the status bar as well.

The spectrum screen might show a yellow line (solid line and dashed line as well). That line indicates the frequency range of the training window that is currently shown in the steering panel – if that window is not neutral but has an active training direction. That yellow lines can be shifted, positioning and moving the mouse cursor. The frequency range of the appropriate training window will change accordingly.

The amplitude scaling of functions depicted in the spectrum screen can be modified either in panel Steering or moving the cursor to the right border of the spectrum screen. Moving the cursor to the right border will let pop up a scaling slider.

c) Training Design: Frequency Windows

A training design consists essentially of a set of filters that have a frequency range and an evaluation function assigned. In Tab "Training" eBioo offers two rows of 8 Filters (in eBioo called Frequency Window). Every Frequency Window (see Steering Panel below) is showing the Band name, the frequency range, the training direction (up or down, in eBioo called: promote and inhibit) and a training function (Amplitude, Coherence, etc.).

In the bottom line of each frequency window there are 3 tiny buttons with arrows left and right. Clicking onto these buttons the frequency range of that window can be modified.

j) Assessment + full CAP support

(Tuner+ or Trainer variant only)

Selecting the

Main Menu – Assessment – START Assessment

an assessment session is started. In that session all 19 or 21 electrodes positions can be measured. The results are reported in ONE report – instead of only 2 or 4 electrode positions in one session.

Click START Assessment to initiate the assessment and PAUSE data processing to select an other electrodes pair or quadrupel.

Click STOP Assessment or STOP Data Processing to terminate the assessment session and generate the report. In Tab “Electrodes” the assessment results are shown as BrainMap. For a more detailed description, see chapter:

eBioo Main Form - Assessment

j) T-Score Evaluation or T-Score Training

(Trainer+ variant only)

eBioo 2.0 (Trainer+ variant) provides a T-Score evaluation. The T-Score Evaluation is comparable to a Z-Score evaluation except that a T-Score value is not statistically evaluated with a large number of reference clients to evaluate a median and the standard deviation but is calibrated using a reference client without or only minimal handicaps that serves to provide target values.

See: Options – T-Score calibration

to calibrate the T-Score evaluation.

The T-Score evaluation functions (TS-Amplitude, TS-rel.Amplitude and TS-Coherence) can be used as training function during training and the T-Score values are dumped into a report after the assessment processing has been terminated (via: STOP Data processing).

k) Training functions

The following training function are available in eBioo 2.0 .

These functions can as well be used to be depicted in the spectrum screen !

Classical functions:

Training functions available in eBioo 2.0 STARTER, Tuner and Trainer:

Amplitude
relative Amplitude
Coherence
Asymmetry
relative Asymmetry
peak-Frequency
Band-Amplitude
Power

Training functions available in eBioo 2.0 Tuner and Trainer:

Co-Modulation
Band-Power
Band-Amplitude-Density
relative Band-Amplitude

Experimental functions:

Phase-Sync
differential Band-Asymmetry

- and more - . . .

Getting Started

Quick Info - Getting started quickly

Now, that you have successfully


- installed the software,
- connected to the hardware to get data to be processed
- activated the software for data evaluation & processing

You might be eager to do a first training with eBioo without spending several hours to read the manual completely (?) and without the incentive to use all the special functions that *eBioo* has to offer and more experienced users might appreciate or prefer.


You might want to know within minutes, how to start a training.

1 Using the Simulation Mode as Data Source

- Start eBioo
 - e. g. using the eBioo shortcut found on your desktop
- Select: Option – Tab: Data Source
 - and check if the data source is set to Simulation (Funktion)
 - or set the radio button “Simulation”
- Optional, Examine in Tab: Data Source the Panel “Channel assigned functions (Function Generator)”. There are N lines with 3 columns. Line 1 is giving an info about the configuration of sub-screen 1 of the spectrum chart. Column 3 of each line is saying which function of the function generator is assigned to the according sub-screen. Column 2 of each line is saying to which hardware channel that function is directed to.
- Optional, Examine Tab: Options - Function Generator.
 - The function Generator is providing several artificial functions (1-6), offering the opportunity to configure values for Amplitude%, frequency, wave form, modulation type, modulation%, modulation frequency and modulation wave form.

- Close the options form and
- START data processing, e. g. using the  button.
- You should see the configured artificial functions of the function generator in the raw data screen and its spectrum in the spectrum screen. Exercise: If you want, try to understand the current configuration and/or modify (on-the-fly) some parameters of the function generator (of functions that are currently used) and see the difference.
- Select Tab: Feedback and set active e. g. “SOUND Feedback – all Training Rows”. If no WAVE file is assigned a Windows sound should be heard.
- Exercise: Examine in Panel “detailed Training Scores – Field: Average Score” the value changes and see that the sound can be heard if the Average Score has a positive value
- Exercise select Tab: Steering and modify the “Global Reward Ratio” and hear the difference
- Exercise: Try to configure different feedback signals

2 Using the EEG-Amplifier / Hardware as Data Source

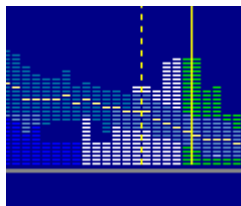
- Start eBioo
- Select Tab: Electrodes and stick the electrodes onto the scalp position that is configured or select the positions
- Select: Option – Tab: Data Source
- Select Data Source: Training (Electrodes)
- START data processing, e. g. using the  button.
- Select a Feedback as described in the chapter above
- Exercise: like described in the chapter above
- Exercise: select Tab Training and activate more training windows
- Exercise: select Tab Training and select other training functions
- Exercise: select Tab EEG-Spectrum or Options Tab “Display” and select other spectrum display functions

(see next page)

Amplitude

Median Amplitude

The median amplitude or function value is depicted as horizontal yellow dash in every column. The median amplitude or median functional value is that value where 50% of the evaluations of a particular time interval (20 evaluations of the last second or 100 evaluations of the last 5 seconds) had shown higher values and 50% have shown lower values.



A25/A75-Amplitude

The A25/A75-amplitude band serves to estimate the variability and is depicted as band above and below the median functional value.

The A25 amplitude or function value is defined accordingly as the amplitude where 25% of the evaluations of the recent time interval showed lower values.

The A75 amplitude or function value is defined accordingly as the amplitude where 75% of the evaluations of the recent time interval showed lower values.

Cursor Positioning Info & Status Line Values

LoTheta	Col: 40 F: 3,9 Hz A: 42,3 %	1 waves : delta t= 0,3 sec. delta f= 3,9 Hz.	Screen 2 : Amplitude = A (ch,col) [uV]
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Moving the mouse cursor on a particular point on the screen the particular data and coordinates are printed into the status bar on the bottom of the main screen.

A percentage value will show the percentage of the current mouse position as percentage for the distance from baseline relative to the current maximum amplitude. The column number is displayed and some of the column data together with the appropriate average feedback time delay and frequency uncertainty.

Channel and Function Assignment

In the 2-channel version there are currently maximal 2 sub screens as spectrum screen available. Every sub screen can be assigned to different or even the same (hardware) data channel

and to a particular display evaluation function, using the right-mouse-click quick selection or using the appropriate selection menu in the Options form.

Note: The display function assignment in the spectrum screen is independent from the function selection in the training window and does not influence the feedback evaluation.

Electrodes Screen

Click on Electrodes

A click onto an electrode site will select that electrode site. The electrode site selection has no functional meaning, but serves only as display information.

Built-In Training Designs

Executing a Right-Mouse-Click onto the electrodes panel displays a PopUp Menu with several Built-In-Training Designs such as:

- Delta inhibit
- C3/C4 Beta/SMR Training
- Delta and HiBeta inhibit
- Theta/Beta Ratio inhibit
- O1/O2 Alpha Amplitude Training
- F3/F4 Alpha Asymmetry inhibit
- F7/F8 Alpha Synchrony Training
- Pz Alpha/Theta Training

The loaded configuration can be checked in Tab: "Electrodes" and Tab: "Training" and Tab: "Steering".

(see next page)

T-Score evaluation

T-Scores as training function

The eBioo Trainer+ variant offers the opportunity to do a T-Score training using Training functions TS(Amplitude), TS(relAmplitude) and TS(Coherence):

T-Scores as spectrum chart and numerical report

These T-Score functions can as well be configured to be depicted as spectrum chart and are reported as csv-session report and assessment report.

T-Scores concept in eBioo

A T-Score value of any function is a value that is in general in the range of -2.0 to +2.0, but can practically be in the range of up to -4.0 up to +4.0. Values in the range of -0.8 up to +0.8 are regarded to be values in the normal range.

But in eBioo the T-Score values have to be calibrated using a reference person (where as Z-Score values are statistically evaluated using a reference GROUP). For a basic understanding of T-Score and Z-Score evaluations see particular publications and seminars concerning that topic.

Please NOTE:

Very "normal" values like e. g. 0.0 does not mean, that this value is optimal. Peak-Performers are in a certain way "not normal". Normal in the concept of Z-Scores or T-Scores does only mean: "average", but for a person having some handicaps, being normal might be an achievable (first) goal.

See also chapter: Options – T-Score Calibration

Options

(- see Chapter : Options Form -)

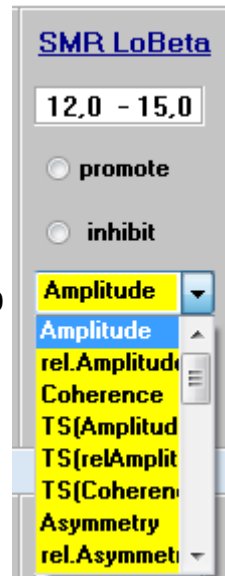
Trends

The results of the current session can be displayed as trend graph.

The trend screen provides two different trend types:

- Spectrum Amplitude values and
- Training-Frequency-Window values.

As spectrum Amplitudes the amplitude type Band-Amplitude, Amplitude, relative Amplitude and Coherence can be charted. The Training-Window values can be charted as real value and as score. The score is a value with positive sign ((amplitude) value is greater than the threshold) and negative sign (value is less than the threshold value). The amplitude scaling in the trend screen is designed to show the real value of the spectrum and corresponding training function of the appropriate selected training window (Only if all training windows that are set active (reward or inhibit) have the same function selected, so that all training windows have the same unit. If the active training windows have different functions (and thus different units), the Y-Skala is sketched and normalized as %-value (0 up to 100%) where 100% is the maximum of the appropriate function.



(End of Extract)