

Quick start with Neurobit Optima device

Preface

This document is intended to ease first steps with Neurobit Optima equipment. It does not replace Neurobit Optima manual and associated documentation.

Neurobit equipment can be used with various software, modalities and sensor systems. Please familiarize yourself with manuals/instructions of software and sensors, which you are going to apply. As an example (*italics*), the use of BioExplorer software (v. 1.7) for one channel EEG measurement is briefly described below.

Software setup

If you have not installed a software application, install it first.

1. *Connect BioExplorer license key to USB port.*
2. *Download the latest BioExplorer installer (full version) from its manufacturer's website:*
<http://www.cyberevolution.com/download.htm>

HINT: Demo version may not implement Neurobit Optima.

3. *Run the installer and proceed in accordance with messages showing on the screen.*

Upgrade Neurobit Driver used by your software application:

1. Download the latest driver version for your application from the webpage:
http://www.neurobitsystems.com/download/Neurobit_Runtime-versions.htm
2. Unpack the downloaded archive to a suitable folder of your application, overwriting existing files. That application should not be running during this step.

*HINT: Administrator rights may be required in your system to overwrite the older driver files.
For BioExplorer the archive should be unpacked to the main folder of the application.*

Bluetooth installation

The following instructions apply to Microsoft Windows 10/8/7/Vista/XP systems.

If your computer is equipped with built-in Bluetooth hardware (like most portable computers), make sure, that it is on. (Some computers have got special button to switch Bluetooth and/or WiFi, or suitable icon on the task bar. In case of doubts consult user's manual of your computer.)

If your computer has not got internal Bluetooth hardware, install suitable Bluetooth USB adapter (typically delivered in a kit with Neurobit Optima):

1. Connect the adapter to USB port.
2. The system should detect the new hardware and automatically install required drivers (already available in the system, no CD or download is required).

If you have not got necessary Bluetooth USB dongle, we suggest to buy BT0037 or BT0015 adapter by LogiLink. However during its installation do not use the CD attached to it.

Neurobit Optima setup

1. Open a battery compartment at the bottom of the device, slightly pressing an arrow on the lid with the thumb and pulling it out. Insert 2 fresh AA batteries (alkaline or rechargeable Ni-MH), observing polarity, in the following way: put in a battery with positive pole turned down, push it to metal contact in the enclosure, next squeeze in the negative pole end. Draw the lid.

2. Briefly press on/off button. The Power indicator should light green and the device should beep shortly.

HINT: The device automatically shuts off after 5 min. in idle state (without a connection to the computer). If it occurs during next steps, simply turn on the device again.

3. Place the Optima in the vicinity of the computer.
4. Pair Neurobit Optima with your computer to enable Bluetooth communication.

Note: Depending on system version and configuration, authorization may be required during above process.

- Windows 10:

- a) In the Windows menu select the Settings icon and next click the group Devices.

Alternatively, on the task bar you can right click Bluetooth icon (if not hidden) and select "Show Bluetooth devices".

- b) Click or press the button "Add device", and next "Bluetooth".

Bluetooth devices detected in the vicinity (and not paired yet) will be listed within a few dozen seconds. Wait until there appears "Serial Port Device" (the name of Optima Bluetooth module). Select that device.

- c) In the PIN field enter device pairing code: 0000. Click or tap the Link button.

- Windows 8:

- a) In the system "Control Panel" run the "Devices and Printers" module (visible in large or small icons view).

Alternatively, on the task bar you can right click Bluetooth icon (if not hidden) and select "Show Bluetooth devices".

- b) Tap or click "Add device" button.

- c) Bluetooth devices detected in the vicinity (and not paired yet) will be listed within a few dozen seconds. Wait until there appears "Serial Port Device" (the name of Optima Bluetooth module). Select that device, then tap or click Next button.

- d) Enter device pairing code: 0000. Tap or click Next button.

- Windows 7:

- a) In the system "Control Panel" run the "Devices and Printers" module (visible in large or small icons view).

Alternatively, on the task bar you can right click Bluetooth icon (if not hidden) and select "Show Bluetooth devices".

- b) Click "Add device" button.

- c) Bluetooth devices detected in the vicinity (and not paired yet) will be listed within a few dozen seconds. Wait until there appears "Serial Port Device" (the name of Optima Bluetooth module). Select that device and click Next button.
- d) In next window select "Enter pairing code for the device" and write down the code: 0000. Click Next button.
- Vista:
 - a) In the system "Control Panel" run the "Bluetooth Devices" module (visible in large or small icons view).
Alternatively, on the task bar you can right click Bluetooth icon (if not hidden) and select "Show Bluetooth devices".
 - b) Click "Add wireless device" button.
 - c) Bluetooth devices detected in the vicinity (and not paired yet) will be listed within a few dozen seconds. Wait until there appears "Serial Port Device" (the name of Optima Bluetooth module). Select that device and click Next button.
 - d) In next window select "Enter pairing code for the device" and write down the code: 0000. Click Next button.

After successful pairing close the window.

IMPORTANT: Right after pairing of the device (and before you start any application interoperating with it), only the Power indicator of the device should shine. If the Link indicator shines as well, probably a driver of used Bluetooth hardware is not fully compatible with Windows and will not work with Neurobit Optima. When such situation appears for a computer with internal Bluetooth hardware:

- a) disable internal Bluetooth according to user's manual of the computer (e.g. with a special button on the keyboard), and next
- b) return to the section "Bluetooth installation" and follow hints for a computer without internal Bluetooth hardware.

Preparation for measurements

1. Connect selected sensor(s) to the unit. For simplicity of initial checking one channel measurement is recommended.

For typical one channel EEG measurement please connect 3 electrodes to channel A in the following way:

- A+ input: head electrode (for example in Cz site),*
- A- input: electrode on the right earlobe (site A2),*
- VG port: electrode on the left earlobe (site A1).*

Details of electrode application on the skin depend on a montage system in use and are described in a separate instruction.

2. Run your software and select interoperation with Neurobit Optima.

In BioExplorer select the option BioExplorer/Devices from the main menu, in "Device Manager" window click Add button, select your model of Neurobit Optima on the list and click OK.

HINT: Only one Neurobit Optima device should appear in the "Device Manager" window.

3. Configure the device for planned measurement.

In BioExplorer click the button "Optima Config Window" (in the "Device Properties" window). Optima settings window will appear (it may take a few seconds, if the unit is off).

There is a tab for each measurement channel. Enable and configure channels, which you plan to use in the nearest session.

For one channel EEG simply check "Channel enable" on "Chan A" tab (the other fields are already set for EEG measurement, by default).

HINT: Channels, which will not be used (i.e. will not be connected to signal sources) in a given session, should have unchecked "Channel enable" fields.

5. Test electrode-skin impedances and continuity of input connections:

- a) Select Test tab in Optima settings window.

- b) Click Test button.

Link and Signal indicators on the Optima front panel should begin to shine and impedances will be shown with bar graphs and digital values on the Test tab. If everything is o.k., all the indicators and bars should be green (and after all yellow). If there is some red, connections and/or electrode application should be corrected.

- c) When you get correct and stable test results, click Stop button, then Close button, close "Device Properties" and "Device Manager" windows with OK and Close buttons.

Measurement session

1. Load an example design (configuration) of data processing and presentation in your software.

In BioExplorer select Design/Open command from the main menu, select a design file, e.g. Examples\AlphaMIDI.bxd, and click Open button.

2. Start a session.

In BioExplorer click Play button below the main menu (or select Session/Play command from the menu). Raw measured and/or processed signals should now appear in BioExplorer Instruments window(s). Some audio and/or visible feedback may be also available – depending on a loaded design.

Additional resources

Sets of example designs of data processing and presentation for several software applications can be found in the Designs folder on CD delivered with the equipment.

For BioExplorer software the archive

Designs\BioExplorer\Neurobit_designs_for_BioExplorer.zip should be unpacked (e.g. to Designs subdirectory in this software installation directory), with preserved structure of folders stored in the archive. When a selected design (e.g. Neurobit\Optima4\EMG.bxd) is open in the application (Design/Load in the main menu), short design description can be shown (menu option Design/Notes).

Suitable settings of device channels are loaded along with a design for BioEra Pro and BrainBay software.

Design files of BioExplorer (ver. 1.7) do not include device settings. For this reason the delivered designs are accompanied by corresponding device configuration files (e.g.

Neurobit\Optima4\EMG.nbc). Instead of manual channel configuration it is possible to load suitable configuration file with Load button in the device settings window (BioExplorer/Devices/selected device/Properties/"Optima Config Window").

Additional hints for BioExplorer users

1. Only one Neurobit Optima device should appear in the "Device Manager" window.
2. If you have added Neurobit Optima in the "Device Manager", but the Link control of the unit blinks green and measurements do not start, check if you have enabled at least one measurement channel in the device settings window.
3. Flashing green Link control in Neurobit Optima unit may also result from selection of incorrect device model (e.g. 4-channel instead of 2-channel one or vice versa) in the "Device manager".
4. When there are some enabled measurement channels, which are not (correctly) connected to signal sources, the device may signal errors with Signal indicator and beeps. Thus, all unused channels should be disabled in the device settings window.
5. BioExplorer does not configure Optima channels based on a design of signal processing. Thus, when you open a design using different number of channels or different modalities than recently, Neurobit Optima settings should be adjusted manually.
6. In order to facilitate frequent adjustments of a device configuration, you can save selected settings with Save button in Neurobit Optima settings window, and then restore them with Load button, when needed.
7. BioExplorer keeps the device on and measuring even when a session is stopped in the application. In order to save batteries you can simply turn off the device, when you do not need it.