

The use of BioExplorer 1.6 software with Neurobit devices.

Quick start

Setup

1. Neurobit equipment wirelessly transmits data to a computer. Neurobit Optima uses Bluetooth standard, while Neurobit Lite uses IrDA link. If the computer is not equipped with suitable built-in wireless port, appropriate USB adapter is required. Necessary drivers are installed according to adapter manual.
2. If you use Neurobit Optima device, it should be paired (added to a list of devices configured for interoperation) with your computer. If you have not done this step, follow the device manual.
3. Connect BioExplorer license key to USB port.
4. Install BioExplorer application downloaded from its manufacturer website: <http://www.cyberevolution.com/download.htm>. During setup, proceed in accordance with messages showing on the screen.
5. When setup is finished, restart the operating system.
6. Upgrade Neurobit Driver used by BioExplorer: http://www.neurobitsystems.com/download/Neurobit_Runtime-versions.htm
Unpack the downloaded archive to the main BioExplorer folder (overwriting existing files). The application should not be running during this step.

Preparation to the first session

1. If you use Neurobit Lite unit, place it in the range of the infrared adapter (optimally about 30 cm), turned to it with black cap of the battery compartment.
2. Apply selected sensors (we propose the test with one EEG signal at the beginning) and turn on the unit.
3. Launch BioExplorer application.
4. Select the option BioExplorer/Devices from menu of the application, in “Device Manager” window click Add button, select your Neurobit device on the list and click OK.
5. For Neurobit Optima device click the button “Optima Config Window” in “Device Properties” window. In device settings window turn on selected measurement channels (“Channel enable” option on individual channel tabs). If necessary, you can also change other settings, according to hints in the device manual. For the start we suggest to enable channel A and to remain other settings in the default state.

For Neurobit Optima you can next test impedances of electrode-skin contacts or sensor circuits on Test tab.

After those actions close the device settings window, as well as “Device Properties” and “Device Manager” windows.

HINT: Device configuration will be restored at next start of the application. If necessary, you can modify the settings (or test impedances for Neurobit Optima), selecting BioExplorer/Devices option again, pointing at the device in “Device Manager” window and clicking Properties button.

6. A word “Connected” should appear on the status bar of BioExplorer (under the menu and icon bars). Measurements will start in the device. Transmission progress bar will appear on the Neurobit Lite screen, or Link and Signal controls will light up in Neurobit Optima unit.

If BioExplorer does not correctly connect to the device, check the chapter “Known issues” near the end of this document.

Session with an example design

1. Using the option Design/Open load one of ready-to-use designs of data processing and presentation, for example Designs\Examples\AlphaMIDI.bxd. In this example design, the feedback signal is a level of alpha brainwaves, traditionally associated with relax (similarly to Relax protocol built-in into Neurobit Lite device for stand-alone use).
2. To start a session click the icon Play (under the main menu of the application; it is equivalent to menu option Session/Play).

There should appear moving graphs in Instruments1 window. The feedback signal is presented with sounds and bar graph on the screen (more alpha waves the longer the bar). Apart from that, raw EEG signal is showed, as well as the course of alpha waves in time and frequency spectrum of the EEG signal (vertical axis of the spectrum diagram corresponds to amplitude of individual wave components of the EEG, with frequencies given on the horizontal axis; alpha brainwaves have frequencies in the range of 8 to 12 Hz).

3. If there is a need, you can change settings of processing or presentation blocks, e.g.:
 - scale of the raw EEG diagram (select the option Objects/Oscilloscope1 from the application menu, then change Sensitivity value on the card CH1 of appearing window), or
 - range of sound pitch corresponding to the level of alpha waves (select the option Objects/MIDI1, then change the parameter “Notes/Input range”).

Another example of data processing and presentation can be the design Designs\Examples\FlashPacMan.bxd, including a simple Flash game controlled with the EEG signal.

When become skilled a little, you can modify the example designs included in the package (e.g. you can choose another frequency band of the trained brainwaves) or build your own designs. The software also enables signal recording on the disc, replaying of recorded sessions, creation of reports and many other features.

Using video files for biofeedback

1. In Design menu of the application select Open and choose an example design for video files: MultiThresholdVideo.bxd.

2. Click Instrument2 window (or VideoPlayer1 element in signal diagram window) with right mouse button. Select Properties, on Playlist tab click Add button and select a video file to play. Click OK in Properties window.
3. Click Play button to start a session.

By default the video is played whenever signal amplitudes in three EEG bands meet a criterion. With different connections of VideoPlayer element inputs also brightness and other parameters can be controlled by feedback signal.

If there is a problem with a specific video file format, please test if it can be played in Windows Media Player. If not, additional plug-in for WMP may be required.

DVD biofeedback

DVD preparation

Correct DVD control depends on proper interoperation of a few software components from different manufacturers, especially:

- Microsoft Windows operating system,
- DVD decoder (often not included in the system, but purchased separately),
- BioExplorer application using DVD interface of the operating system.

Compatibility problems are quite often here.

1. First of all, ensure that you can play DVD in Windows Media Player (Microsoft application included in the system). Run the application (e.g. from your system Start menu). In Play menu click "DVD, VCD or CD Audio" option and select DVD drive. DVD should start playing. However, if you will see the message, that WMP cannot play DVD because no compatible DVD decoder is installed, you have a few options:
 - a) Free DScaler decoder, compatible with BioExplorer, is available on the webpage http://www.free-codecs.com/dscaler_mpeg_filters_download.htm.
 - b) Some decoders compatible with WMP are listed on the webpage <http://www.microsoft.com/windows/windowsmedia/player/plugins.aspx#DVDDecoder>. They can be bought via Internet and downloaded.
 - c) Alternatively, you can purchase a software package for DVD, which includes the decoder for WMP, for example WinDVD or PowerDVD.
2. In main menu of BioExplorer select BioExplorer, than Preferences. On the tab "DVD settings" select navigator, video decoder and audio decoder. (If there are a few video decoders in your system, you can select one by chance. If it will not work properly, install and select DScaler decoder mentioned above.)
3. At the beginning it may be convenient to test DVD with example session data from disk. In Session menu of the application select Playback option and choose session file Examples\CESample.bxs. Answer "No" to the question "Open Session's Design?".

(After successful initial test of DVD playing you can switch to physical measurements with Session/Capture option and then Session/Play.)

DVD session

1. In Design menu select Open and choose example design DVD.bxd.
2. Place DVD in drive. After a while select Session/Play option in BioExplorer menu (it will start signal processing). Then click start button and Control button in DVD window of BioExplorer (at the bottom).
3. DVD should be played now, with image size and brightness controlled with feedback signal. With other connections of DVD Player element inputs also volume can be controlled or movie can be stopped, when signal is under given threshold.

If there are problems with DVD, further information can be found in BioExplorer help, in chapters "Design Object Reference"/"WM DVD Player" or "DVD Player".

Known issues

1. If you have added Neurobit Optima in the "Device Manager", but the Link control of the unit blinks and measurements do not start, check if you have enabled at least one measurement channel in the device settings window.
2. Flashing 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".
3. BioExplorer does not configure Neurobit Optima channels based on a design of signal processing. Thus, when you load a design using different number of channels or different modalities than recently, Neurobit Optima settings should be adjusted manually.
4. In order to ease frequent adjustments of Neurobit Optima configuration, you can save selected settings with Save button in the device settings window, and then restore them with Load button, when needed. These features are available from v. 3.2.3 of the Neurobit Driver.
5. BioExplorer keeps a 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.
6. BioExplorer requires that sub(set) of enabled channels includes subsequent channels starting from A, i.e. for example {A} or {A, B} or {A, B, C}, but not e.g. {B, D}.
7. In some circumstances BioExplorer fails to initiate measurement mode in Neurobit Lite unit. Among other things, this effect occurs when the unit is turned off while BioExplorer is launched or the device is added in "Device Manager" of the application. If the unit is turned on later, physical measurements don't start (even if you click Play button in BioExplorer window). There is no bar indicator of data transmission on the unit's screen (options of the device's menu are displayed there instead).

If the device is connected with BioExplorer (a word "Connected" displayed on the status bar of the application) and the device isn't in the measurement mode for any reason, please simply turn off the device and turn on it again. (Alternatively, you can disconnect the device logically in "Device Manager" with square left to the device name and logically connect it there again.)

Then the device should enter in the measurement mode. Transmission progress bar should appear and run on the device's screen. Assuming, a valid design is loaded into BioExplorer (e.g from Designs/Examples directory), graphs updated in real time should appear in instrument window of the application. (Maybe you then need to set up sensitivity or other parameters of design objects, e.g. "Spectrum Analyzer", to make these graphs well visible.)

8. Some of antivirus/protection software may block transmission between Neurobit unit and BioExplorer. There is the word "Connected" in BioExplorer status bar but the device is not in measurement mode (menu is still displayed on its screen) and no signal is processed in the application. In such a case you can temporarily deactivate the protection software to test, if it resolves the issue. If so, you can activate protection again, but configure so called exception for BioExplorer and/or infrared driver to avoid the blockade. Details of the operation are specific to the protection application and should be available in its help.
9. If you tested old version of BioEra (another biofeedback software) with Neurobit Lite device and have installed IrComm2k driver required by that application, to enable connection with BioExplorer uninstall that. (Newer versions of BioEra application do not use IrComm2k driver.)
10. If you use Neurobit Lite device, please remember that computer-based session is initiated from computer side, and not with Start! command from the device's menu. (For stand-alone trainings, initiated with Start! in the device, no data is transmitted to computer.)

Further information about BioExplorer

1. Help menu.
2. Electronic tutorial:
http://www.itallis.com/shop/index.php?main_page=product_info&cPath=13&products_id=26.
3. „BioExplorer" group in Yahoo: <http://groups.yahoo.com/>.
4. Technical support of the software manufacturer, CyberEvolution, Inc.:
<http://www.cyberevolution.com/support.htm>.