BioGraph Infiniti V3.1: Key New Features

## *BioGraph Infiniti: Main Application*

Inter-beat Interval calculation – EKG R-spike detection algorithm

➢ A new *IBI from EKG – Dual threshold* algorithm is available for recording sessions with the EKG sensor. The algorithm is designed to minimize the effect of EMG related artifacts and provides a more stable signal for heart rate biofeedback. The other algorithm, *IBI from EKG*, has to be used for the *HR max – min* or *Synchronized Event from EKG* computations.

Main Database – IBI Data Export

➢ The *Export Data* function includes an *IBI Export* option that outputs inter-beat interval data from any session recorded with a BVP or an EKG signal (1 signal per export). The function creates a standard text file (ASCII, comma separated values) with a single inter beat interval value per line. An option to include a time column is available.

Note: The *IBI Export* function works with both the *IBI from EKG* and the *IBI from EKG – Dual threshold* algorithms.
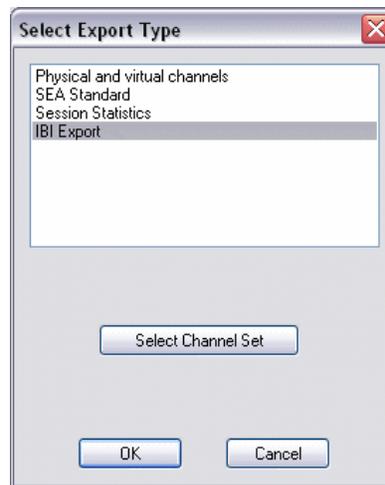
Starting a Script Session – Encoder Protocol Drop-Down List

➢ When Starting a Script Session, the Script Database dialog box shows a drop-down list for the user to *Select an Encoder Communication Protocol*. This allows shorter lists of scripts.
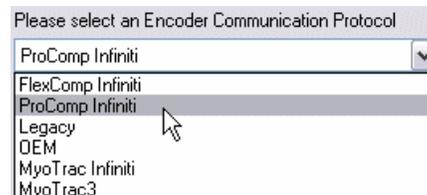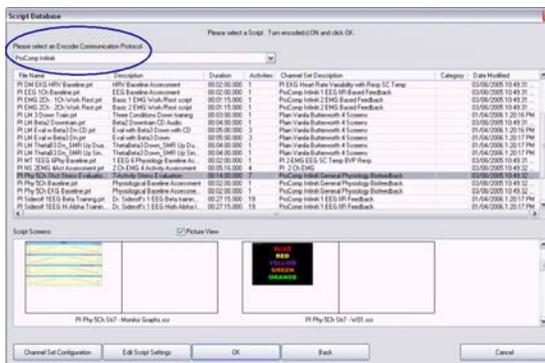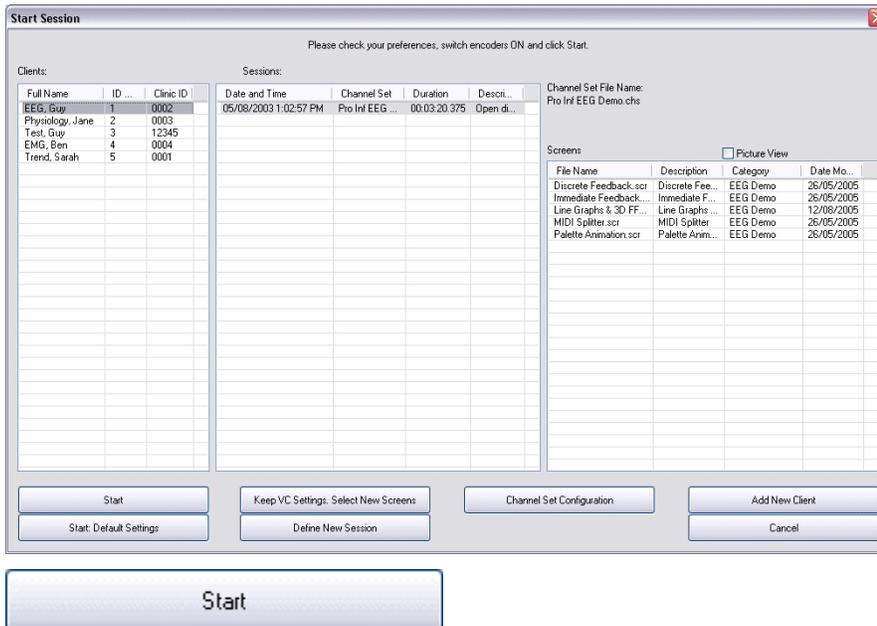
Start Session sequence – Shorter Start sequence

➢ The session start user interface now allows clinicians to start a session using the settings from any previously recorded session. When starting a session, simply click on the *Start Open Display Session* or *Start Script Session* button on the Main Menu screen.
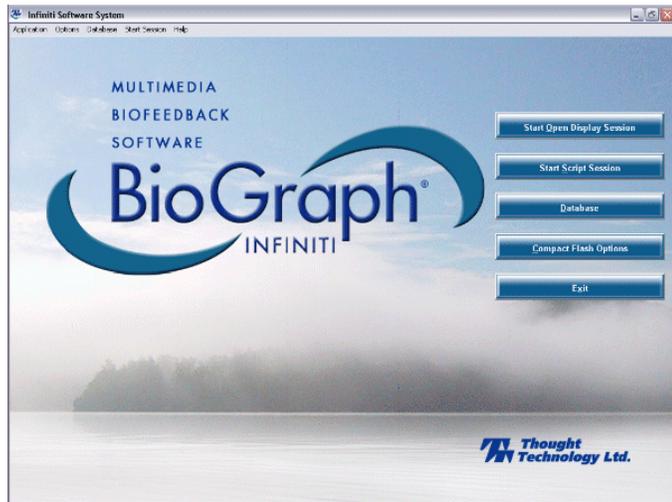

➢ In the Start Session screen, click on a *Client Name*, click on the session you want to copy the settings from and click *Start*.

Start Session sequence – Option to see screen thumbnails

➢ A redesigned session start user interface shows a thumbnail image of all the display screens on your system to facilitate session configuration. The thumbnails show 1 to 5 screens for an open display session and all the screens used by a script session. In the Start Session screen, click the *Picture View* option to see the screen list as thumbnails with screen names appearing below the image.
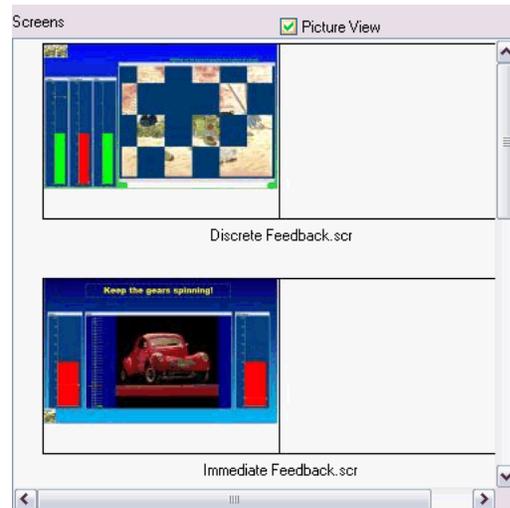
Start Session sequence – Faster access

➢ The session start interface was streamlined to dramatically reduce the number of clicks. The *Channel Set Options* and *Battery Level* function are now available as menu items:
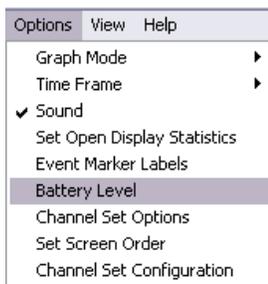
➢ After recording a session, the program allows you to rapidly switch to the review or to the replay mode:
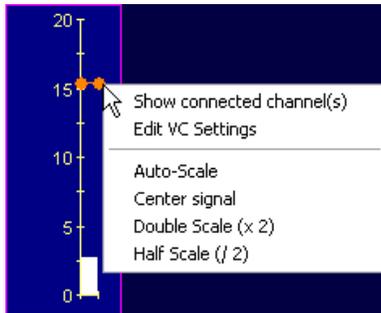
➢ When exiting the review mode, the program asks if you want to return to the recording screen:

Screen instruments – Auto-scaling and centering functions

➢ All scale-based screen instruments have right click menu options for auto scaling and centering, as well as for rapidly increasing or decreasing the scale:


New Feedback options: DVD Instrument

➢ A new DVD feedback instrument allows users to control up to 4 independent playback actions from feedback conditions. Actions include Playback ON/OFF, Sound Low/High, Image Zoom In/Out and Image Size Grow/Shrink. The instrument also allows the user to click DVD menu items and select different DVD chapters while recording.

Auto-threshold – Manual/Automatic jump toggle

➢ The *Percentage Instrument* allows you to rapidly toggle between a manual threshold and an automatic threshold mode, on the fly:
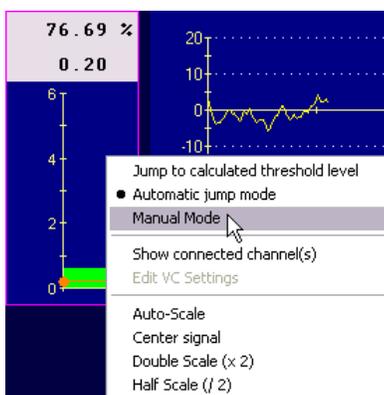
Script Sessions – Edit Step Duration

➢ Prior to starting a script session, the *Edit Script Settings* dialog box allows you to modify the default duration of any selected step. New options to modify all steps with the *Same Step Duration* or with *Same Step Screen* make this process easier:

## Script sessions – *Edit VC Settings* button in activity statistic popup

➢ The *Edit VC Settings* button allows you to make changes to the session's virtual channel settings between activities. This would be useful, for example, if you need to adjust the threshold value, in a percentage over threshold computation, based on the mean that was just calculated during a baseline activity:

Histogram instrument – Real-time & off-line trending

➢ A modified histogram instrument allows you to plot 1 to 8 epoch-based statistics on a real-time trend graph. The graph instrument can show lines or bars and the epoch duration can be modified on the fly.
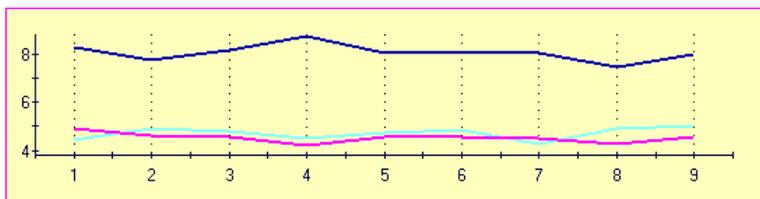

➢ The same instrument can be used in review mode for a quick assessment and there's an option in the session report dialog to include this graph in the printout:
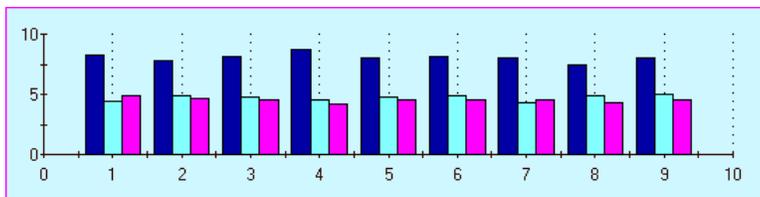
Saving Sessions – Option to Delete Video

➢ After recording a session with synchronized video data, the program gives you the option to discard the video data at saving time. This is useful if you don't really need the video data as it takes a lot of hard drive space:
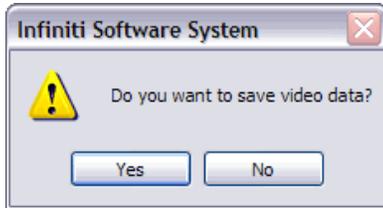
Client Database – Trending Open Display sessions

➢ The trend report function allows you to trend across two or more open display sessions, as long as they were recorded using the same channel set.

Client Database – Session Review & Data Export

➢ Data can now be exported from an open display session using a different channel set from the one that was used to record it, as long as both channel sets have the same encoder & sensor configuration.

Recording Sessions – Pre-Defined Event Markers

➢ A new feature allows you to pre-define a list of event marker labels and assign them to keyboard keys. While recording, simply press CTRL plus a key to place a marker with that label:
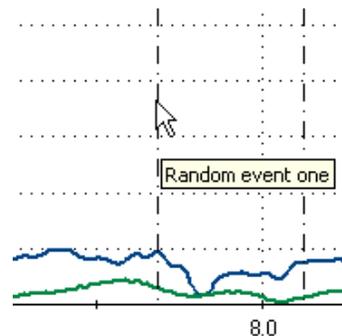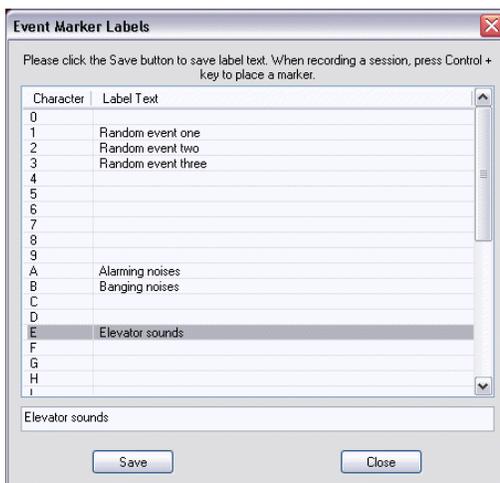
Reviewing Sessions - Auto rejection settings

➢ A new option to *Reject automatically when switching to Review* mode allows you to define automatic artifact rejection settings and run them automatically when switching to the review mode:

Reviewing Sessions - Statistics

➢ When reviewing open display sessions, an option to *Show All* or *Show only Statistics* helps you find the relevant statistical channels with ease:

BioGraph Infiniti: Developer Tools

Screen Editor – Label Instrument

➢ The *Label* instrument's right-click menu offers an option to *Show Channel Description*, which opens a list of virtual channels from which the user can select a virtual channel description to rapidly set the label text to the description text.

Screen Editor – Exiting the Editor

➢ When exiting the *Screen Editor*, if one or more screen instruments are not connected to virtual channels, the program warns the user about that fact and highlights one of the instruments that need to be connected.

Screen Editor – Option to Fit to Screen

➢ In the Screen Editor, full and Lite versions, the Options menu includes a *Fit to Screen* option which allows you to instantly resize a screen to fit different monitor resolutions. Simply drag the lower right corner of the screen to the desired size and click *Fit to Screen*.
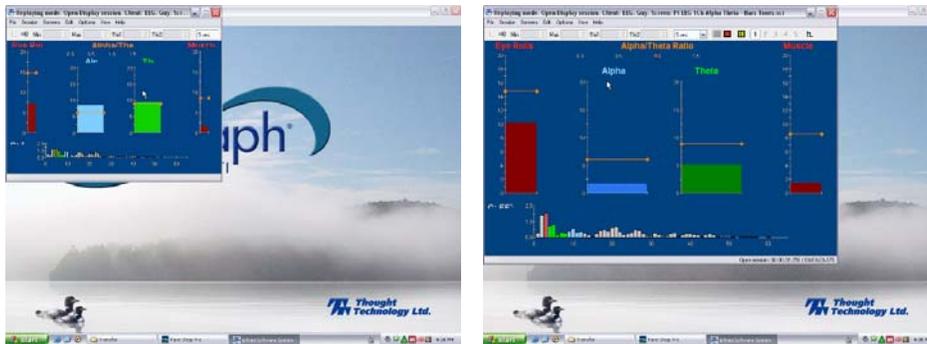
Screen Editor – Templates

➢ The template editor was completely redesigned to include more powerful features: You can now toggle between a graphical and a numerical display.
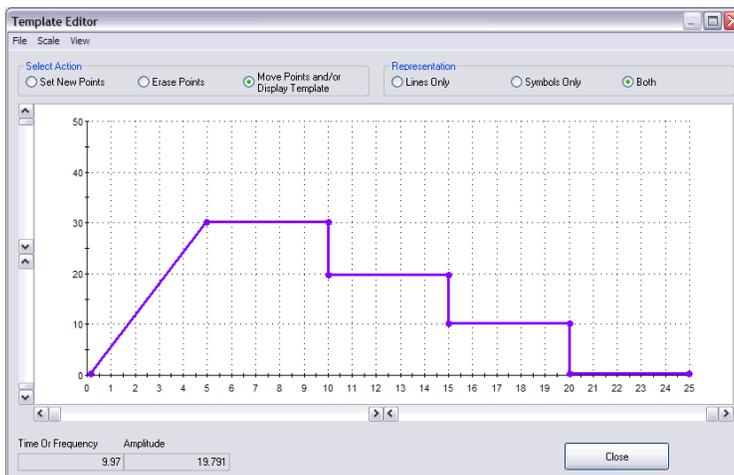
➢ In the table view, you can copy and paste sections of template.
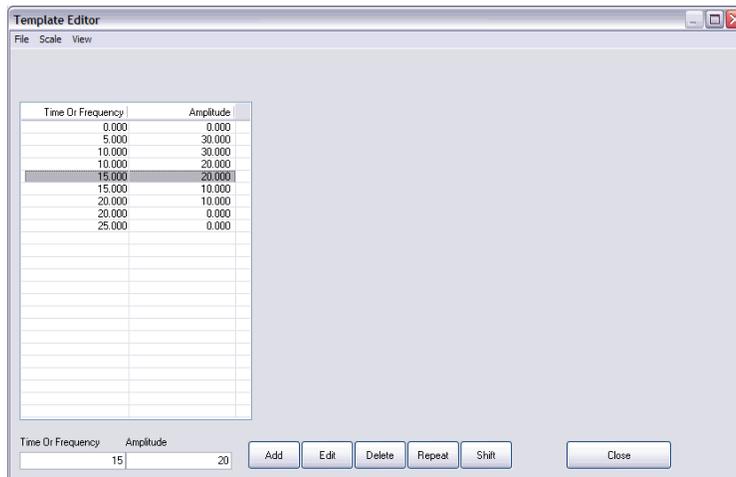
➢ Once a template is designed, you can define whether it should be drawn only once (absolute time-base) or *Cycled* until the end of the session (relative time-base):
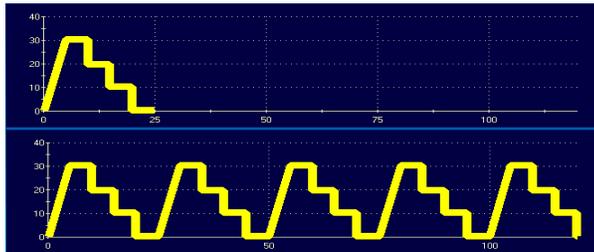
Script Editor – Convert Script

➢ A *Convert Script* function allows users to convert a script to a channel set different from the one originally associated to it. This allows script sessions to be reviewed, and data to be exported, using a different channel set from the one that was used to record it, as long as both channel sets have the same encoder & sensor configuration.

Script Editor – Onset and Release Time

➢ A new calculation method allows you to define *Onset* time and *Release* Time calculations from selected virtual channels. This is most often useful for EMG Work/Rest activities.

Other new features...

➢ **Support for MyoTrac 3 device**. Note: Although the MyoTrac 3 device uses MyoScan sensors, because it performs an RMS conversion and resamples the EMG, internally, the actual signal we get from the MyoTrac 3 is EMG RMS at 32 samples per second. *Note: The zero crossing data, which is generated by the device, is not presently supported within BioGraph Infiniti.*

➢ **Line graphs – Templates**: If a template is defined with a "relative" time scale, the Reset button will re-start every time it is clicked.

➢ **Settings instrument**: When recording a session with a screen that includes settings instruments, the cut-off frequencies that are saved with the session data are the last ones shown on the settings instrument, instead of the client or default values.

➢ **Settings instrument:** The Settings instrument can be connected to a comparator channel and the comparator value can be modified on the fly. This can be useful to third-party game developers because the comparator channel can be used as a virtual threshold.

➢ **The maximum session duration is now only limited by available hard drive space**. *Note: Reviewing extra long sessions might take a very long time to process. Processing time depends on session duration, number of sensors, sampling rates and how full the channel set is.*

➢ **The maximum refresh rate was increased from 8 times per second to 16 times per second.** *Note: The actual refresh rate on any particular computer is a function of available computer power and complexity of signal processing (channel set + # of screen instruments). Even if the maximum is set to 16 times per second, the actual rate might be less than that.*

➢ **A new prototype "Lissajous" instrument was added to the screen editor**. The requirements for this instrument came from Siegfried Othmer. It has two amplitude scales, one horizontal and one vertical. It is designed to demonstrate phase between two identical EEG frequencies (ex 8 Hz for EEG 1 & EEG 2) but it can be used with other signal types (ex for quadrant type feedback).

➢ **Review mode - Statistics pop-up**: The activity and step descriptions are shown instead of just numbers.

➢ Script Editor: *Test Script* **function shows the screen thumbnails** instead of just the screen names.

➢ Script Editor: *Progress Bars* **also show the actual durations for each step, activity & script.**

➢ Editors: A "**Date Modified" column** was added to the tables to facilitate the task of locating files under development.

➢ Editors: **All three editors now make a copy of the original files when editing.** The original file is only overwritten when the user saves the changes.

➢ **Filled Line graphs can now be defined with a template.**

➢ Channel Set editor: Two new prototype Synchronized Event algorithms were added: "*Step Start Event Average*" **and "***Synchronize Event from Comparator*".**

➢ **The Coherence algorithm was changed to match the one from Bob Thatcher's NeuroGuide database**.

➢ **Review mode – line graphs**: New data export option: Shift Key and drag "Export Segment Physical and Virtual Channel Data"**.**

➢ Client Database: When a session was recorded for a selected client and the database screen is accessed after saving, **the client's name is remembered and already selected in the table.**

➢ Screen Editor – Bar graphs: Added an option to "*Invert Signal*" to show a positive value on the negative scale. **This is useful to create "Mind Mirror" type displays.**

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