



# NEAR-INFRARED HEMOENCEPHALOGRAPHY (NIR HEG) SUITE

ERNESTO SHOLOMAN KORENMAN, PHD, AND ELIZABETH TEGAN



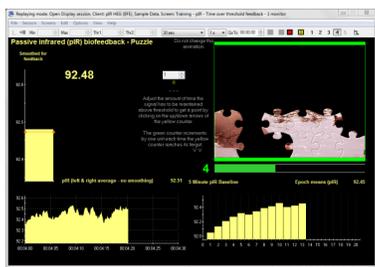
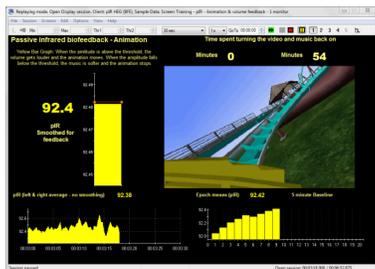
## Limited Edition Software Suite

Hemoencephalography (HEG) biofeedback is the method to self regulate regional brain activity by monitoring changes in regional cerebral blood circulation and oxygenation. Near-infrared (nIR) HEG biofeedback, popularized by Dr. Hershel Toomim, shines red and infrared light into the brain and measures the relative ratio of light received back by the sensor, in accordance to blood perforation & oxygenation of the below tissue. HEG is proving to be a simple and effective tool for frontal brain training, in particular for ADHD, depression and migraines.



An advantage of nIR HEG is that unlike EEG, HEG does not measure electricity, therefore it does not experience artifacts of eye-blinks, eye-movement and other muscle activity-related artifacts during the session. The signal itself is also an easy-to-read ratio amplitude.

Elizabeth Tegan, senior software developer and experienced practitioner in biofeedback and neurofeedback, designed the nIR HEG Suite with the direction of Ernesto Korenman, PhD, a psychologist with a wide formal training that is well versed in the field of HEG. Together they created a nIR HEG suite that is easy to use for all levels of therapists and that allows the monitoring of non-HEG sensors. The suite includes:



- Five choices of Quick Start sessions to run, dependent on which sensors combinations are desired for recording data:
  - nIR HEG training only;
  - nIR HEG training with monitoring of Heart Rate & Respiration;
  - nIR HEG training with monitoring of EMG, Skin Conductance & Temperature;
  - nIR HEG training with monitoring of Heart Rate, Respiration, EMG, Skin Conductance & Temperature;
  - nIR HEG training with monitoring of EEG.
- All recording sessions have a configuration choice for being used with a 1-monitor or 2-monitor setup.
- Suite documents include a software manual, reference material and articles pertaining to the HEG.

Please note that this is the Near-Infrared Hemoencephalography (nIR HEG) Suite, and should not be confused with the Passive-Infrared Hemoencephalography (pIR HEG) Suite that is also sold by the Biofeedback Federation of Europe (BFE).

## Education & Training Opportunities

The BFE currently offers two different types of online lessons/sessions designed to meet your diverse education and training needs. All sessions provide continuing education (CE) credits to psychologists.

- 1-Hour **Introduction to the HEG Suites Webinar**: Jon Bale, BFE Research Manager, reviews the software and documents included in both the “pIR HEG Suite” and “nIR HEG Suite” from assessment to training. The webinar covers the following items; authors, goals of the suite, physiological understanding of HEG, HEG or EEG, necessary equipment, sensors & accessories, training Quick Start screens and advantages of the BFE suite over the TTL suite.
- 6-Hour **HEG Online Class**: online instruction from a qualified instructor on HEG training for use on a general population. This class is well suited for beginners or experienced practitioners that want to learn about the HEG suite and incorporate HEG training methods in their practice. All aspects of using the software will be covered in great detail, and recorded data will be reviewed to ensure proper recording. Interpretation of data by the instructor will occur, however focus is maintained on being able to successfully use all aspects of the software and equipment.



**For more Information or Questions:** To purchase the suite and/or education & training, go to the BFE Shop:

[blueheg@gmail.com](mailto:blueheg@gmail.com)

[www.bfe.org/buy](http://www.bfe.org/buy)



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## BioGraph Infiniti Software

BioGraph Infiniti Software is the core of all current and future Thought Technology Biofeedback and Psychophysiology products. It provides a multimedia rich graphical experience, while capturing and analyzing raw data. It includes all the features and functions required to run our specialized application Suites and offers the ability to customize your own screens and suites using the Developer Tool . **BioGraph Infiniti version 5.1.4** is designed to provide full compatibility with the latest Windows 7 operating system.



## Choose the Encoder to Meet Your Needs

You only need one of the encoders to run the software:



- **ProComp Infiniti encoder** is the eight-channel, multi-modality encoder that has all the power and flexibility you need for real-time, computerized biofeedback and data acquisition in any clinical setting. We only ever use two sensors with this suite.
- **ProComp2 encoder** is a compact, 2 channel version of the ProComp Infiniti encoder, which can be easily worn on a head band or a shirt collar. It can record data from up-to two sensors simultaneously.



## Select Sensor Measurements for Collecting Data

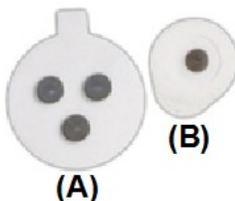
This list consists of all the sensors that can be used with the suite. Only the near-infrared sensor and headband are required. All other sensors are for optional data monitoring and are only available for use with the ProComp Infiniti encoder (ProComp 2 can only use the nIR HEG sensor & headgear)

### Required sensor (ProComp Infiniti & ProComp 2):

- **nIR HEG sensor & headband**, which are manufactured and purchased from MediTech or one of its dealers.

### Optional sensors (for ProComp Infiniti encoder edition only):

- **MyoScan-Pro sensor** is a pre-amplified surface electromyography sensor for measuring muscular tension. Disposable electrode pads are necessary with this sensor.
- **EEG-Z sensor** is pre-amplified electroencephalograph sensor with built in impedance checking, for measuring brainwaves. **EEG monopolar/bipolar kit with DIN cable** is also necessary to use this sensor.
- **BVP sensor** is a blood volume pulse detection sensor (otherwise known as a PPG sensor) housed in a small finger worn package, to measure heart rate & HRV
- **Respiration sensor** is a durable, latex girth belt for monitoring respiration rate, waveform and amplitude sensor.
- **Skin Conductance sensor** measures the conductance across the skin, and is normally connected to the fingers.
- **Temperature sensor** measures skin surface temperature



## Disposable Electrodes for MyoScan-Pro (EMG) Sensor

If using the MyoScan-Pro sensor, it is necessary to purchase at least one type of disposable electrodes for its effective use. There are two potential electrode placement types, so there are also two types of electrodes for purchase. The **triode (A)** disposable electrode is used for narrow placement and the **unigel (B)** for wide electrode placement.

## Additional Computer Setup Information

The software suite allows (but does not require) for a dual-monitor setup for training clients. Purchase of a second monitor is required if the user wishes to take advantage of that option.