

HEG-Sensor-System

Step by Step Manual



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<http://www.meditech.de> / <http://www.brainfeedback.de>

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1. HEG-Sensor – Details about the manufacturer and the device



Manufacturer: *MediTECH Electronic GmbH*
Langer Acker 7
D-30900 Wedemark
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fax: +49-(0)5130-97778-22
Email: service@meditech.de

Name: HEG-Sensor
Art.-Nr. 8655

Classification: class 1 with measuring functionality



Internally powered equipment
Continuous operation



Read Manual carefully before using the HEG-System.

2. Security regulations

- ↵ Explosion Hazard; Do not use in the presence of a flammable anesthetic mixture with air, or with Oxygen or Nitrous Oxide
- ↵ Do not operate Active Sensors within 10 feet of an operating cellular phone, similar radio transmitting device, other powerful radio interference producing sources such as arc welders, radio thermal treatment equipment, x-ray machines, or any other equipment that produces electrical sparks.
- ↵ After use, the Disposable Electrodes may be a biohazard. Handle, and when applicable, dispose of these materials in accordance with accepted medical practice and any applicable local, state and federal laws and regulations.
- ↵ Electro-magnetic fields can impair the HEG-Sensor's proper level of functionality.
- ↵ Not to be immersed in water.
- ↵ Take care in arranging patient and sensor cables to avoid risk of patient entanglement or strangulation.
- ↵ The operator is responsible for ensuring the safety of any devices controlled or triggered by Infiniti equipment or software, or by any software or hardware receiving data from Infiniti equipment.
- ↵ The individual user of the system is required to operate the system in line with the valid security regulations for the encoder and the connected equipment.
- ↵ Use of any equipment in a biofeedback context should be immediately terminated upon any sign of treatment-related distress or discomfort.

Attention:

- ↵ Sensors damaged by static electricity are not covered under warranty. To prevent static discharge from damaging the sensor and/or encoders, use anti-static mats or sprays in your working area. A humidifier may also be used to prevent static environments by conditioning hot, dry air.
- ↵ Do not apply any electrode gel or equivalent directly on the sensor snaps. Always use electrodes as a medium between the sensor and the client.
- ↵ Not for diagnostic purposes, not defibrillator proof, not for critical patient monitoring.
- ↵ To prevent voiding warranty by breaking connector pins, carefully align white guiding dot on sensor plug with slot on sensor input.
- ↵ Do not plug third party sensors directly into instrument inputs. Use only encoders by Thought Technology. All electrodes and third party sensors must be connected to active sensors, either directly or through an adapter.
- ↵ Remove batteries when the device is not being used for an extended period of time. Please dispose of battery following local regulations

INTENDED PURPOSE

↵ Bio-Feedback, Neuro-Feedback

Note:

- ↵ No preventative inspections required; maintenance must be performed by qualified personnel
- ↵ If a fiber optic or patient cable is damaged or breaks please replace.
- ↵ The operator must be familiar with typical characteristics of signals acquired by this equipment, and be able to detect anomalies in the acquired signal that could interfere with treatment effectiveness. Depending on the importance of signal integrity, it may be advisable to continuously monitor the raw signals, in time and/or frequency domain, while the device is being used for biofeedback or other purposes. If anomalies are observed on acquired signals, and if you suspect a problem with electromagnetic interference, contact Thought Technology for a technical note on identification and remediation.

Important:

This HEG device is calibrated together with the headband attached. If you use a headband of the former generation (black foam material with blue coat), this combination must be calibrated again. Please contact us.

3. Background information on HEG

HEG biofeedback is a new form of "brain training" modality that is showing great promise for dealing with various problems like ADD (attention deficit disorder), depression or autism – in conjunction with EEG biofeedback.

HEG stands for HEMO-ENCEPHALO-GRAPHY. As indicated by "HEMO", this new form of biofeedback relates to blood - in this case blood flow within the brain. It appears that blood flow is poor in certain brain areas of persons suffering from several types of "brain problems". These include ADD/ADHD, autism, epilepsy, brain injury, stroke, depression, and schizophrenia.

Researchers have found that this poor blood flow in a section of the brain can be increased with biofeedback training in much the same way as EEG biofeedback. Results on ADD/ADHD and Autism to date have been fair to good. Using HEG biofeedback initially, and finishing up with EEG biofeedback, may shorten the number of sessions dramatically, and also may improve the success rate. Hence, HEG by some is considered to be a new and particularly promising form of Neurofeedback.

HEG biofeedback is an effective and drugless treatment for many neuro-psychological conditions which involves the self-regulation of cortical activation.

HEG devices measure and feed back changes correlated with blood flow dynamics and cellular metabolism in localized parts of the brain cortex. These measurements are closely linked with brain activation due to the phenomenon of "neurovascular coupling".

HEG biofeedback represents a simple and non-intrusive way for both: monitoring and training cerebral function without the inconvenience of electrode preparation which other neurofeedback methods generally require. HEG has high compliance by clients and patients and the training can be delivered with a help of entertaining and attractive feedback suitable for children and adults.

The logic behind this biofeedback intervention is that repeatedly engaging in HEG biofeedback, "exercises" the brain in a unique way which confers very promising and long lasting neuro-behavioural benefits for the trainee. Special pre/post SPECT (Single Positron Emission Computerized Tomography) imaging techniques has been already used to verify that HEG biofeedback treatment promotes conspicuous blood flow increases, (activation), below the treated areas.

4. Required components for conducting HEG-sessions

Required components

- HEG-Sensor by *MediTECH*[®]
- Headband for HEG-Sensor
- Biofeedback device (alternatives, labeled as Encoder in the following)
 - i. ProComp2
 - ii. ProComp5
 - iii. ProComp Infiniti
 - iv. FlexComp Infiniti
- TT-USB Adapter with USB- and fibre optics cable
- BioGraph-Infiniti-Software
- HEG-Suite for BioGraph Infiniti

Scope of Delivery

- HEG-Sensor by *MediTECH*[®]
- HEG headband
- English manual
- 12 V power adapter, 2,08 A in accordance with medical product regulations
- Solid hardtop case for storage and transportation

Required consumables

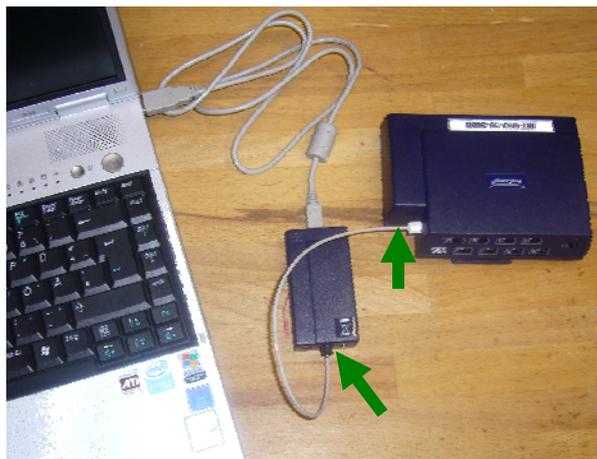
- HEG headband cover rings (prod. nr. 8783)

5. Connecting and setting up the HEG-System

1. Connect your TT-USB-Adapter with your PC via USB cable.



2. Now insert one end of the fibre optic cable into the TT-USB-Adapter and the other into the ProComp Infiniti (or your alternative biofeedback system).



3. Make sure that all connections are made as they should. Standard channel setting for the ProComp Infiniti is the following: **G=RED;**
H=I-RED

Note: Please note that the channel setting may differ between different Biofeedback systems. You may verify the currently defined channel set with help of the Biograph-Infiniti-Software.



4. Always remember to turn on your ProComp Infiniti (or your alternately used Biofeedback system) prior to usage and to turn it back off after usage.



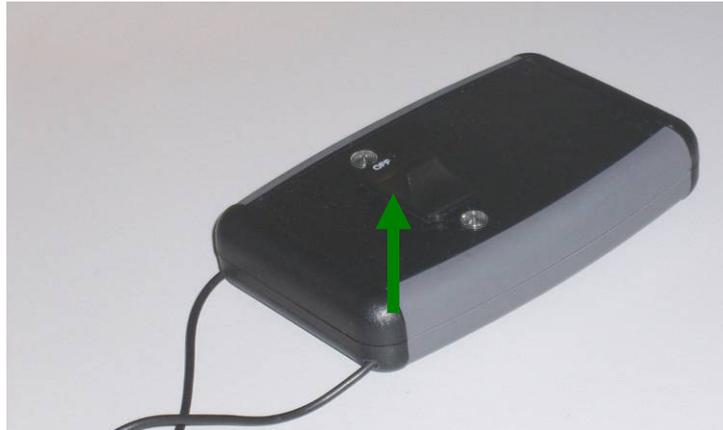
5. Now connect your headband with the HEG-Sensor. Make sure that the Odu special plug is fully connected to the HEG-Sensor.



6. Before placing the headband on your client's skin, always clean it with a commercially available detergent and dry it thoroughly afterwards with a clean cloth.
7. Place the headband on your client, making sure no hair is in the way. The headband should be stiff, but not overly tight.

Caution: Replace the cover ring on the sensor frequently (depending on your level of usage at least once a week).

8. Turn on your HEG device prior to usage.



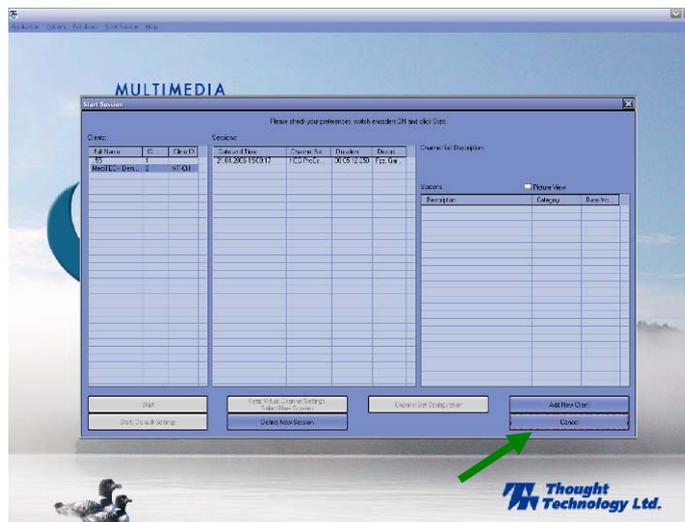
Note: Please make sure to turn of the unit after usage!

6. How to launch an HEG training session

1. Launch the BioGraph-Infiniti-Software. In order to start a new HEG session simply click on the „OPEN DISPLAY SESSION“ button on the upper right hand side of the screen.



2. Now you create a new client by clicking on „Add new client“.

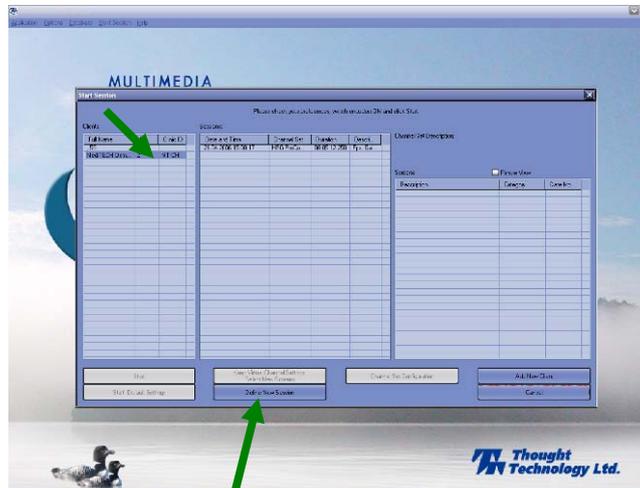


3. Enter all relevant data in the popup dialogue box, then click „OK“
Minimal requirements are Name, Firstname, gender and date of birth.

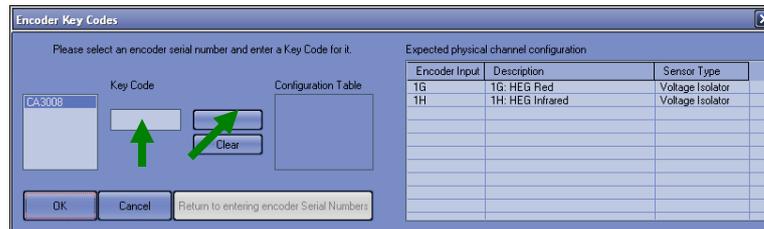
Client Data

CLIENT ID:
Clinic ID:
First Name: Last Name:
Sex: Male Female Birth date:
SSN/SIN: Home phone: Work phone:
Street:
City: State/Prov.:
Country: Zip/Postal code:
Referred by: Diagnosis:
INSURANCE
Claim number: Type:
Company: Insured:
Contact: Phone:
Street:
City: State/Prov.:
Country: Zip/Postal code:
History OK Cancel

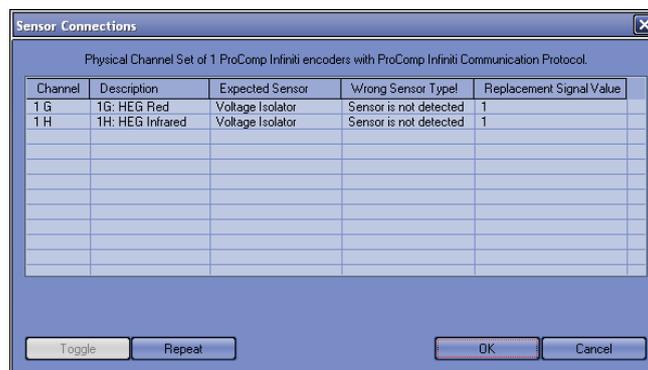
4. Now select your previously created client with a left mouse click.
Then start a new session by clicking on the „Define new session“ button.



- When first launching your biofeedback system the following dialog window appears. You need to enter your encoder key code at this point which you can find on the inside of your encoder's battery compartment. After entering the code, click on the button with an arrow pointing to the right in order to register the key.



- In the following you once more get to see the dialogue window with the sensor connections valid for the chosen channel set. If other sensor connections are available, they will also show here. This allows you to comfortably and reliably check if you connected all sensors as needed / intended.



7. Maintenance, charging and storage

- The HEG sensor is a rather sensitive electronic device and must be treated with a corresponding amount of care. When disconnecting the sensor cables, please do not pull on the wire but always on the plug at the end of the cable! For cleaning purposes, please always use a soft cloth.
 - Use the original sensor case both for storage and transportation.
 - **ATTENTION!** Avoid static charging of the unit as this may lead to erratic behaviour or bring damage to the unit.
 - In order to dispose of your unit, make sure to follow regional / national requirements to the line. It is best to return the unit to your distributor / manufacturer for this purpose to ensure compliance with domestic regulations.
- 
- The headband itself can be separated from the actual sensor and must be machine washed at 30° at least once a week.
 - The sensor components and corresponding cables must be cleaned before usage with a commercially available detergent and a soft cloth. You need to ensure that the power adapter is disconnected and carries no voltage.

Recommendations for charging:

The following hints give you an idea when the rechargeable batteries should be charged again:

1. The blue LED becomes pale.
2. The gain curve just grows until it reaches the top part of the scale.

The complete charging progress of the rechargeable batteries takes about 1 ½ hours. With completely charged batteries the HEG-sensor can be used about 5 up to 6 hours.

The HEG-sensor can be used when it is connected with the power source. In this case the current supply is provided by the power source and not by the batteries.

In order to avoid interferences during the training we recommend that the HEG-sensor is just used with current supply with the batteries.

Connect the plug of the main adapter with the socket (see image). Now connect the main adapter with the current supply. The charging will be started directly. The white LED is on.



The charging is finished when the white LED is off.

8. Technical Maintenance

You are not permitted to conduct technical service / maintenance on the unit. Contact your national distributor or MediTECH hotline by email, phone or fax. We will discuss what options we have to best resolve your problem.

9. Technical specifications

1. Serial badge



2. Technical data

Power supply	9V battery
Current	max. 55 mA
Connections	12V power supply, 1 x headband connection
Size	12 cm x 8 cm x 3,5 cm (incl. 67 cm connecting cable to the encoder)
Weight	166,60 g (incl. rechargeable batteries)
Measuring range	See Procomp manual for reference
Frequency range	460 – 800 Hz
Accumulator capacity	250 mAh
Exit signal → Encoder	0 - 600 mV (RMS)
Exit signal → Headband	max. 6 V
During operating mode:	
Acceptable temperature range:	+ 10 °C to + 40 °C
Relative humidity (environment)	30 % to 75 %
Air pressure	700 – 1060 hPA

Storage and transport:	
Acceptable temperature range :	- 20 °C to + 50 °C
Relative humidity (environment)	20 % to 95 %
Air pressure	700 – 1060 hPA

10. EC declaration of conformity

The listed product is in compliance with the following regulation:

93/42/EWG

“EC norm on Medical products dated July 14th 1993“.

Issued by:	MediTECH Electronic GmbH Langer Acker 7 30900 Wedemark
Product name:	Therapy unit
Type:	HEG-Sensor
Classifikation:	Class 1
Corresponding section:	Annex VII

Wedemark, Nov. 1st, 2007
(City and Date)


(Signature of legal representative)

11. Warranty

With the purchase of the HEG-sensor by

MediTECH Electronic GmbH – Wedemark

you get a two year warranty for the impeccable functionality* of the device.

Besides this warranty we offer a **service hotline** for questions and trouble with the BUP and the low level functions for the whole time you work with the device.

The phone hotline is available under the phone number

+49-5130-97778-0

Of course if you have questions you can also

send a **fax: +49-5130-97778-22**

or an **email: service@meditech.de**

* functional problems and damage that occurred due to unintended use are excluded.

We trust that these instructions were convenient and easy to follow.
If you do have further questions, please do not hesitate to contact us at
any time.

Contact:

MediTECH Electronic GmbH
Langer Acker 7
D-30900 Wedemark



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