

Biofeedback Xpert

For pain therapy, psychotherapy and physiotherapy,
mental training and health management



#2.0

SCHUHFRIED

passion for psychology

Get in touch!

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Learn more...

...and fix a date now for an online demonstration. Get a tour of the Biofeedback Xpert interface and learn more about the training. In technical terms this resembles a webinar.

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SCHUHFRIED

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Measure physiological parameters with Biofeedback Xpert: The next generation of wireless biofeedback

Biofeedback Xpert is the innovative cordless biofeedback system from SCHUHFRIED. It can be used for relaxation, rehabilitation and therapy. Put together your package for your individual needs!

Measurement of all relevant parameters

Biofeedback Xpert is the all-in-one package that provides everything that biofeedback trainers and therapists need in their everyday work. All relevant physiological parameters can be measured and depicted, including respiration, skin conductance, temperature, heart rate variability, pulse and motility.

Contact us and learn more about the particular advantages for your individual area of application!



Why Biofeedback Xpert?

1. Cordless training

In our innovative SCHUHFRIED biofeedback system, POINTs transmit the readings transmitted wirelessly to the computer (using Bluetooth® technology). The small, lightweight POINTs are worn directly on the body. The absence of cables ensures a pleasant setting. The trainee is able to move freely, the training situation more closely resembles real life, and new areas of application open up, such as:

- › physiological parameters associated with anxiety states or phobias can be measured in real-life situations (e.g. on a staircase or balcony for clients with a fear of heights).
- › The system can be used in the workplace to reduce muscular tension by correcting physical posture.
- › Athletes train on machines while monitoring takes place.
- › More effective exercises can be used in ergotherapy, for example in sensomotor/perceptive or motor/functional treatment.

2. Modular structure

All the software modules and POINTs can be used in any combination. The system can thus be fully personalized and is highly flexible. If you extend the scope of your activities, the existing system can be added quickly and easily to suit the new requirements.

3. Measurement of all relevant parameters

Biofeedback Xpert is the all-in-one package that provides everything that biofeedback trainers and therapists need in their everyday work. All relevant physiological parameters can be measured and depicted, including respiration, skin conductance, temperature, heart rate variability, pulse and motility.

4. Simple and practical

The user interface of Biofeedback Xpert is clearly laid out and easy to understand. With just a few mouse clicks training can begin. The analysis is well structured and designed with clarity in mind.

All sensors are easy to use. Quick-connect components make the biofeedback system quick and easy to set up. The sensors can be used with all commonly used disposable electrodes.

The sensors are ultra-sensitive and precise – while also being highly stable against artifacts. Biofeedback Xpert meets the requirements of the German Medical Products Act and is registered with the FDA. Biofeedback experts pass on their know-how and expertise to you in a wide range of workshops and seminars.



5. Individually adaptable

An extensive library of background pictures and music enables training sessions to be adapted to the individual user. You can even incorporate and use your own picture and music files. The features of the training session that are displayed on the screen are also variable: with just a mouse click the readings of individual modules can be shown or removed.

6. Allows group sessions

Biofeedback Xpert can display the readings from up to POINTs and 32 channels (parameters) on one screen. This means that several people can train simultaneously and makes it possible to display changes in physiological parameters arising from interactions between individuals.

Introducing SCHUHFRIED

1. SCHUHFRIED has experience

The SCHUHFRIED company, founded as a family business in 1947, has decades of experience behind it. Today the company leads the world in computer-based psychological testing. SCHUHFRIED has always used the latest technology for psychology and medicine and was the first to connect software electronics and psychology.

2. SCHUHFRIED operates globally

41 distributors. Working in 67 countries. SCHUHFRIED is at home all over the world. And is in touch with its roots. The hub remains at the company's headquarters (near Vienna, Austria).

3. SCHUHFRIED wins awards for excellence

"Quality by competence" has been SCHUHFRIED's motto for many years. That is why the company has been awarded the Austrian coat of arms. This is the highest award granted in Austria and is only awarded to businesses that can demonstrate a high level of exports, a first-class credit rating, innovative ability, good quality management and significant investment in research and development.

4. SCHUHFRIED has good contacts

SCHUHFRIED works with experienced experts. At congresses, symposiums and specialist events SCHUHFRIED networks with the other major players in the sector, so that it is always in touch with the latest trends. Or setting the trend itself.

5. SCHUHFRIED specializes in computer-based psychology

The success of the SCHUHFRIED products is based on the unique interplay of the three strands of psychology, hardware and software. All its products are developed in-house, closely coordinated and continuously improved. The importance of product development at SCHUHFRIED is reflected in its expenditure on research and development, which accounts for more than 25 percent of its annual turnover.

6. SCHUHFRIED systems are simple and user-friendly

Using new technology can be a daunting prospect. SCHUHFRIED makes new ventures simple: The systems are easy to use and have many advantages.

7. SCHUHFRIED is a strong partner

SCHUHFRIED goes the extra mile for its clients. The sales team is the first point of contact and can turn many questions asked into questions answered. The Help Desk assists with technical issues. Psychologists advise on all matters in their field.



The modular features of Biofeedback Xpert

Biofeedback Xpert consists of individually configurable components.

Administration software

Training and client data is managed with the administration software that offers a number of practical features. Multiple basic training sessions are included as well.

Read more

... about the administration software starting on page 7

Basic training

The administration software already includes several basic training sessions, including: RESP relaxation exercises, lines feedback, threshold value training, volume feedback and audio feedback.

Read more

... about the basic training sessions starting on page 9

Special training

If required, the following special training can be added to the basic training:

- › Breathing exercises
- › EDA relaxation exercises
- › Confrontation training with picture sequences
- › Confrontation training with videos
- › Voice and Video Recorder
- › Neuromuscular rehabilitation
- › EMG relaxation
- › Heart rate variability
- › TEMP training
- › Activation screening (stress test)
- › Tolerance test

Read more

... about the special training starting on page 12



POINTS and sensors

The sensors serve to record the signals at the surface of the skin. The readings are prepared by POINTs and transferred to the PC via Bluetooth® radio communication.

The following POINTs are available.

- › **MULTI:** Skin conductance
Pulse, blood circulation
Temperature
Motility (movement sensor)
Heart rate variability
- › **RESP:** Respiration
- › **EMG:** Muscle tension

Read more

... about POINTs and sensors starting on page 18

Administration software

The Biofeedback Xpert administration software is used to manage client data, prescribe training and evaluate sessions. The Biofeedback Xpert interface – whose color can be adjusted – is clearly laid out and easy to understand. Basic training is included, to which you can add special training.



The administration software also has a number of practical features:

Database

The database stores all client data, session data, readings, notes, comments and recorded speech. If required, data can be imported and exported as well.

Advice messages

Regular advice messages support the use and provide helpful input. General warnings protect against inappropriate use. You can create and edit advice messages yourself depending on the session structure.

Session sequence

In the session sequence, you can define, save, and therefore standardize your own session structures for particular indications or case. A session structure can consist of multiple training programs with different parameters, times and advice messages.

Therapy library

The therapy library contains training programs and brief descriptions. Training is started via the therapy library. No additional settings should be made.

Modular screen

Bar and line displays, numerical displays and videos can be arranged in any order on the screen. This results in individual training screens for different clients or training approaches.

PRACTICAL TIP

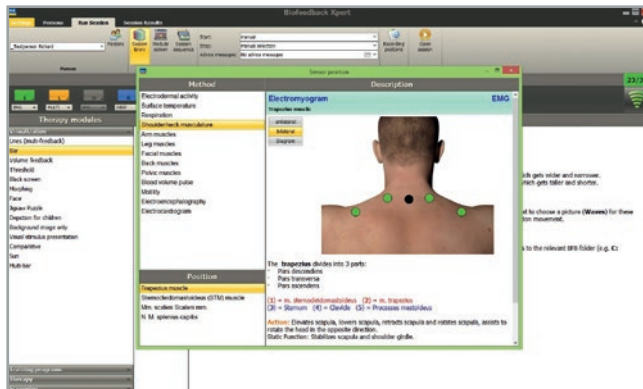
Put together your own threshold training with two or more parameters, such as skin conductance and temperature. If both values change towards relaxation (reaching the threshold for temperature and falling below for skin conductance), relaxing music is played.

Read more

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Sensor position

The exact instructions for how and where to apply the electrodes is stored here.



Background

Training sessions can be designed individually with different background images or colors.

PRACTICAL TIP

You can also add your own pictures to the database. These changes can be saved as default.

Background music

To optimize the training effect, you can use music from the program or from a CD.

PRACTICAL TIP

Or use CDs with relaxation exercises and then discuss the result with the client after the training.

Help

The help includes two online manuals: the “Technical Help” with a description of the program and the “Therapist Help” with general information on biofeedback. In addition, the hardware and software manual are located here.

Set marker

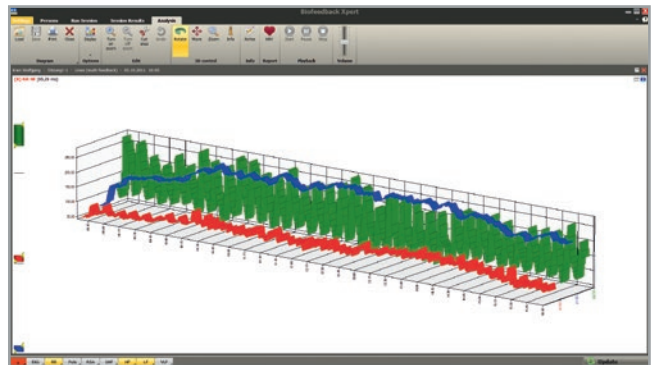
Use this function to document results during the session and add comments.

2-screen-solution

Use this function to display individual images on a second screen. This makes it possible to set up a therapist and a client screen.

3D evaluation

The system can also display the evaluation diagram in a 3D display (bars, bands, etc.) that can be rotated and enlarged.



VIENNA TEST SYSTEM

Psychometric tests

BIOFEEDBACK XPRT

Multi-media biofeedback

Test

Discuss
the results

Measure

Link to the Vienna Test System (psychological assessment):

Biofeedback Xpert and the Vienna Test System – the SCHUHFRIED program for psychometric testing – can be combined: While a psychological test is being administered for assessment purposes via the Vienna Test System, physiological data can be simultaneously recorded and evaluated with Biofeedback Xpert. This makes it possible to measure the client's physiological reactions in a test situation – for example when the client is under time pressure, is concentrating on a task or is making mistakes.

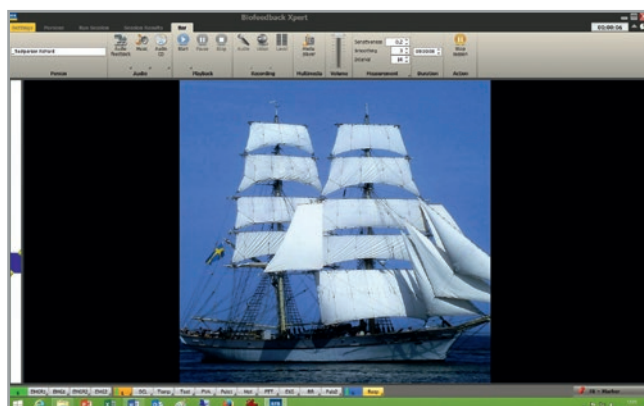
Basic training

The administration software includes the following basic training: Lines feedback, RESP relaxation exercises, threshold value training, volume feedback and audio feedback. In combination with POINTs and sensors, this allows for complex therapeutic applications. Special training sessions can be added to the administration software for further applications.

Therapy functions at a glance

The following basic training sessions are included in the administration software:

RESP relaxation exercises



For this training, the client monitors his breathing and relaxes this way. The breathing is displayed on the screen with a bar or picture segment that expands or collapses depending on the depth of respiration.

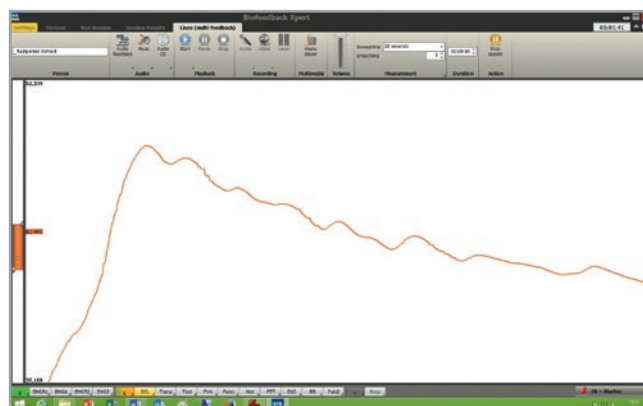
In addition to information on the ability to relax, you can also recognize breathing patterns, breathing frequency and respiration depth.

This training can be adjusted by changing the background images and the music.

Worth knowing

The RESP relaxation exercises are a good preparation for the breathing exercises BFRESP. Read more on BFRESP breathing exercises on page 12.

Line feedback



With this function, all recordable parameters can be displayed in line form. The function serves both for simply recording values (monitoring) and for training.

Sessions can be shaped individually using background images, colors and music.

PRACTICAL TIP

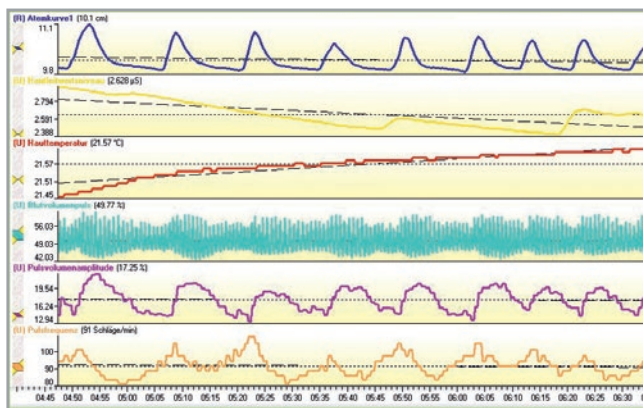
Generally, one line feedback should be performed to relax the client before every biofeedback session (to create a baseline) and to check the correct placement of the sensors.

PRACTICAL EXAMPLE: Relaxation (stress relief)

The trainee has attempted to increase the temperature of his hand to relax.

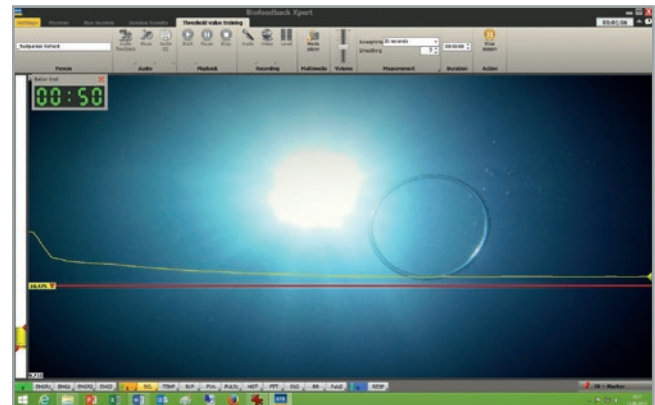
Perform the training with only one parameter, if possible, so that the client can concentrate on the change. You can also record other parameters out of the client's sight. These parameters are displayed after completing the session.

The section of the diagram indicates that the trainee indeed increased the temperature of his hand (red). At the same time, skin conductance (yellow) decreased. Breathing (blue) was slow and even, which resulted in the forming of respiratory sinus arrhythmia – recognizable in the change of pulse volume amplitude (violet) and pulse frequency (orange).



The diagram indicates that the training objective – relaxation – was achieved.

Threshold value training



As with lines feedback, you can use this function to display all recordable parameters in line-graph form. In addition, the therapist defines a threshold. Depending on the training, if the client is able to exceed/fall below this value, he receives positive feedback.

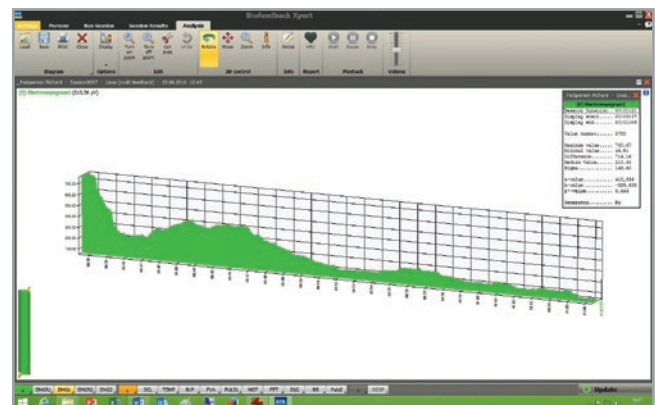
Sounds or music, for children stories (only available in German) are used as a reward. However, you can also set acoustic warning signals that the system outputs for a change in an undesired direction.

When the client achieves the training objective, the threshold is moved and a new objective is defined.

PRACTICAL TIP

You can switch channels during the sessions, such as from EMG1 to EMG2 or from temperature training to skin conduction relaxation.

PRACTICAL EXAMPLE:

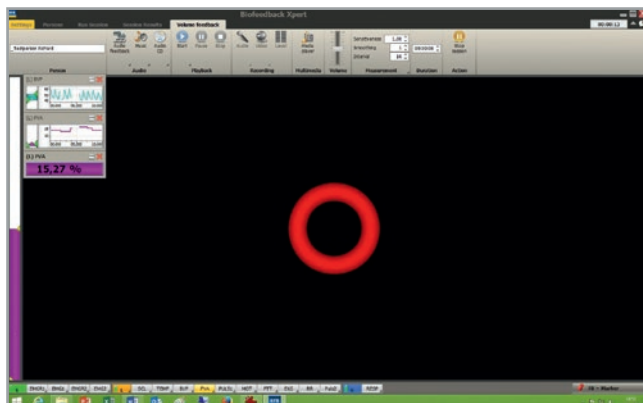


In this case, a client attempted to relax using threshold value training.

The analysis shows that the training was effective. Muscle tension decreased significantly during the session.

The trainings are user friendly; the menu navigation is simple and practical!

Volume feedback



Volume feedback is used for vasoconstriction training (migraine intervention).

Feedback is provided using a circular image which represents the blood flow in the temporal artery. The training consists of making the displayed ring tighter as often as possible.

By stabilizing the artery tonus, the client reduces the number of migraine attacks and/or their severity. This therapy is recommended for children in particular or when medicine does not suffice or no longer suffices.

PRACTICAL TIP

Training with closed eyes and a purely acoustic feedback may help to relax.
You can also select other pictures, such as a balloon, for this purpose.

Audio feedback

Audio feedback allows training all recordable parameters. The program reports changes acoustically by changing the pitch. The client either trains with a background picture or without visual presentation, that is with a black screen.

Acoustic feedback is suited particularly well for regulating breathing, skin conductance and muscle relaxation.

PRACTICAL TIP

Training with closed eyes and a purely acoustic feedback may help to relax.

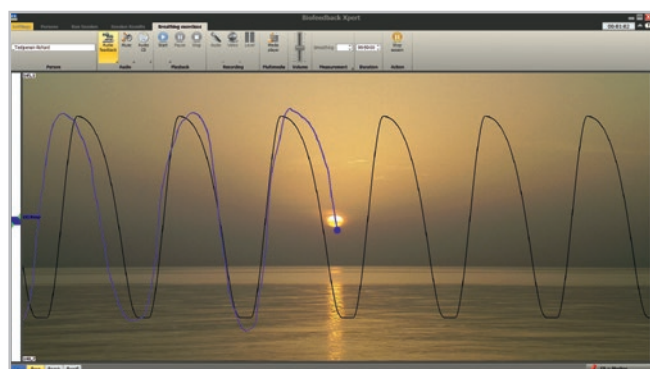
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Special training

BFRESP

Breathing exercises



Areas of application:

- › Relaxation exercises
- › Essential hypertonia
- › Bronchial asthma
- › Migraine, panic attacks, phobias

Description:

This training makes it possible to acquire an efficient and correct style of breathing using an ideal respiration curve.

The program first analyses the client's breathing pattern. It uses this to calculate an ideal respiration curve, allocating 30% of the time to inhalation, 60% to exhalation and 10% to a pause in breathing. Clients attempt to match their breathing to the curve.

Heart rate, blood pressure and muscle tone increase during inhalation and decrease during exhalation. When the exhalation phase is emphasised, as it is in the ideal curve, there is a reduction in the effect of the sympathetic nervous system and in the general level of activity.

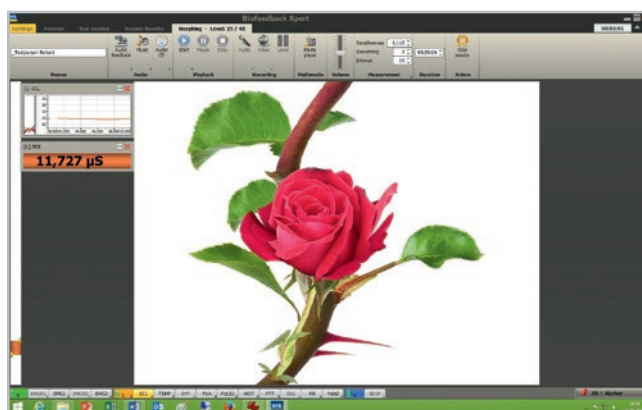
To improve the effectiveness of training you can change the properties of the displayed curve, for example with regard to frequency, steepness of the curve and percentage contributions of inhalation and exhalation. After at the most five training sessions the client is usually able to reproduce the more beneficial breathing pattern, even without feedback.

Required hardware:

- › RESP-P
- › RESP-SM

BFEDA

Skin conductance - relaxation training



Areas of application:

- › Relaxation exercises
- › Stress relief

Description:

The client learns how to control his habitual level of arousal/the sympathetic nervous system activity using the feedback of information about skin conductance.

Inner tension is evidenced by a high degree of activity by the sweat glands and therefore higher skin conductance (EDA). The response in skin conductance takes place immediately after the level of arousal occurs (after 0.6 to 6.0 seconds). Therefore, it is ideally suited to display the correlation between physical and psychological processes.

Choose from the following feedback in EDA relaxation training:

Face

The face on the screen smiles when skin conductance decreases.

Morphing

A change takes place here – for example a bud blooming into a rose.

Depiction for children

Child-oriented displays (such as goldfish, girl, boy) change their posture.

Jigsaw puzzle

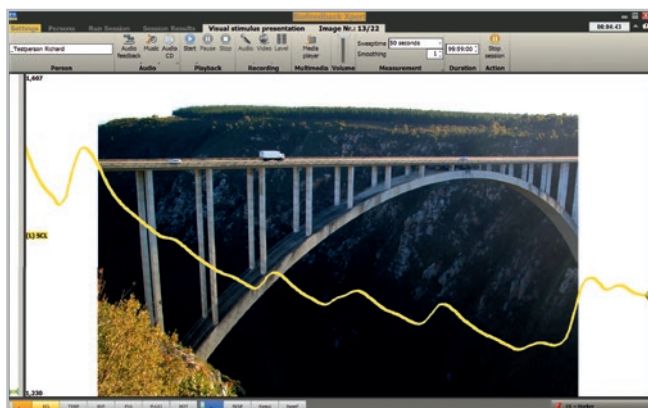
A puzzle is completed.

Required hardware:

- › MULTI-P
- › MULTI-S2 or SC-S

BFKON

Confrontation with picture sequences



Areas of application:

- › Phobias
- › Panic attacks
- › Anxiety disorders

Description:

The system automatically shows a sequence of pictures that generate anxiety or arousal. The client learns how to control the response of his autonomous nervous system and therefore to control his fear.

Due to the fast response, skin conductance (SCL) is a good indicator for anxiety or inner tension. However, since clients in different vegetative systems (SCL, PULS, etc.) exhibit individually different reactions, multiple parameters should be recorded.

To achieve systematic desensitization, the pictures can be controlled depending on the level of anxiety or arousal.

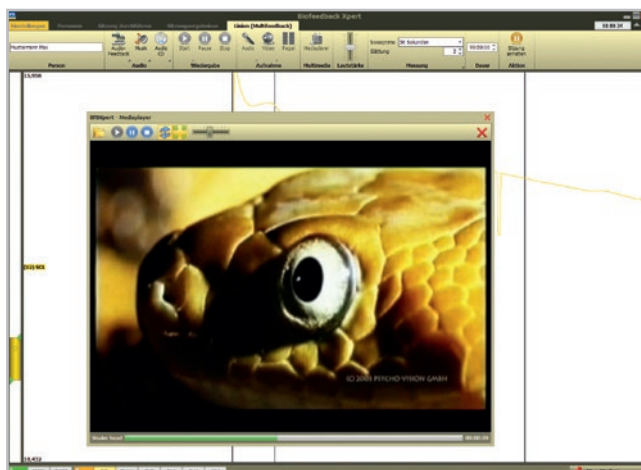
A wide range of different pictures is available. In addition, you can also add picture sequences you created yourself to the program.

Required hardware:

- › MULTI-P
- › SC-S
- › All other POINTs or sensors are possible.

BFVID

Confrontation training with video sequences



Areas of application:

- › Phobias
- › Panic attacks
- › Anxiety disorders

Description:

Confrontation training with videos basically works like confrontation training with pictures (BFKON). However, the system shows video clips instead of picture sequences. The client is therefore more involved in the anxiety-inducing situation.

Required hardware:

- › MULTI-P
- › SC-S
- › All other modules or sensors are possible.

Audio feedback is possible for all training sessions.

BFREC

Voice and video recorder



Areas of application:

- › Case history
- › Exploration
- › Therapy sessions for anxiety disorders
- › Post-traumatic stress disorder (PTSD)

Description:

In addition to the physiological parameters, you can also record the conversation at the same time with the voice and video recorder. The video recorder function is new, which – in addition to the still available voice speech recording – makes it possible to record the conversation as a video.

In the review after the session, abnormal physiological parameters can be assigned precisely to the conversation. The monitor should be placed out of the client's sight to avoid undesired feedback reactions.

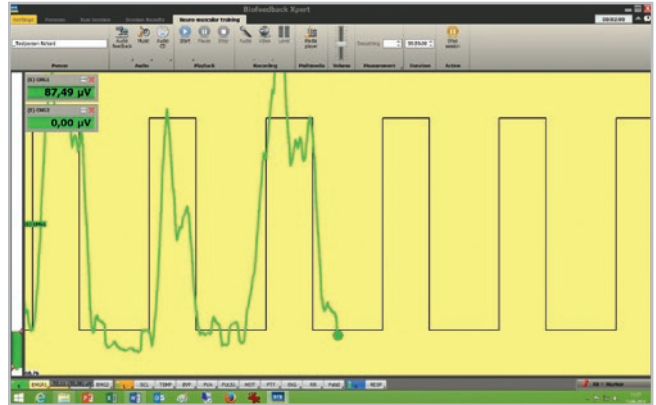
It is possible to transmit the signals of up to seven POINTs (or 32 channels) at the same time. This makes it possible to record physiological parameters of multiple persons in a group session.

Required hardware:

- › MIKRO
- › POINTs and sensors depending on the assessment situation.
- › All available sensors for exploration, if possible

BFMUSK

Neuromuscular rehabilitation



Areas of application:

- › Pareses (paralysis)
- › Locomotor system diseases and injuries
- › Torticollis (wryneck)
- › Radicular pain (headache)
- › Incontinence

Description:

During rehabilitation, the client trains specific muscle groups using a prescribed graphic. The objective is to both increase the client's ability to control muscle tension and to also develop the muscles themselves.

The client tenses the affected muscle group in regular intervals and relaxes them again. In so doing, he attempts to follow the prescribed course of a graphic on the screen. The graphic is based on the values of the client that the program collected during the calibration phase.

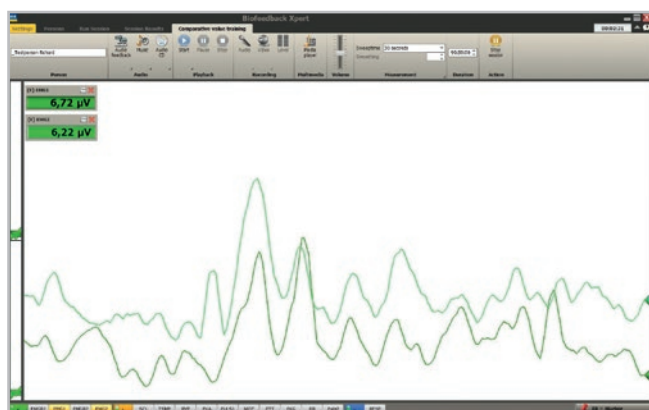
Four options for adjusting the sensitivity and four different filters are available. This way, the client can be given motivating feedback despite weak muscle signals. The contraction phases, the number of repetitions and the breaks can be adjusted individually to make training easier in the first sessions.

Required hardware:

- › EMG-P
- › EMG-Set2
- › EMG-VR2

BFEMG

Electromyography



Application areas:

- › Cervical syndrome
- › Back pain
- › Tinnitus
- › EMG relaxation training

Description:

The client attempts to consciously relax tense muscles.

For cervical syndrome and back pain, the left and right sides of the back can be measured simultaneously. The program displays the recorded values on the same axis. This makes it possible to directly compare both muscle tensions.

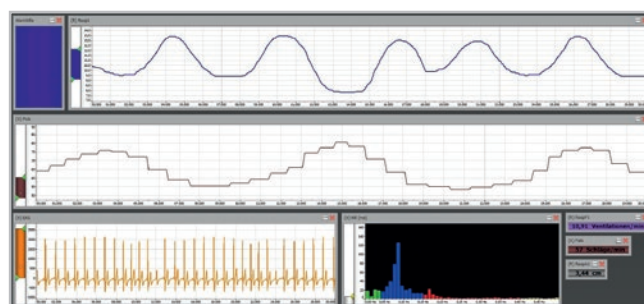
Four different frequency ranges (for slow and fast muscle fibers) provide for ideal prerequisites for targeted training.

Required hardware:

- › EMG-P
- › EMG-Set2

BFHRV

Heart rate variability



Areas of application:

- › Reduction of psychological and physiological tension
- › Psychosomatic disorders
- › Support for the treatment of cardiac diseases
- › Psychovegetative exhaustion
- › Insomnia
- › High blood pressure
- › Coping with stress and anxiety

Description:

The training focuses on coherence of breathing, pulse and blood pressure. Three different types of training are offered for this (baroreflex training, coherence training, RSA training).

Required hardware:

- › MULTI-P
- › M-HRV-S or HRV-S
- › For RSA and coherence training, an RESP-POINT is required in addition to a MULTI-POINT.

BFVASO

Blood circulation



Areas of application:

- › Raynaud's disease
- › Migraine
- › Essential hypertonia
- › Temperature training for general relaxation

Description:

In this training, the client increases the blood circulation of his hands through relaxation.

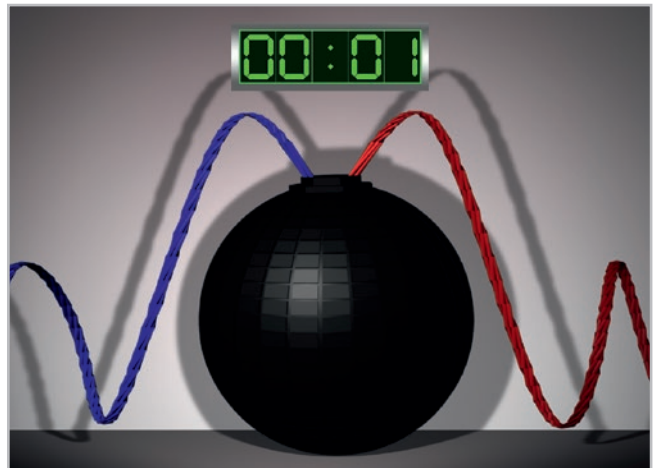
The peripheral blood volume is controlled through vessel motor function, that is through the sympathetic arousal of vasoconstrictor fibers. With increasing relaxation, the vessels expand and blood circulation improves. The hand warms up. Feedback is based on the skin temperature.

Required hardware:

- › MULTI-P
- › MULTI-S2 or SC-S

BFSTR

Activation screening (stress test)



Areas of application:

- › Stress management
- › Psychosomatic complaints under stress
- › Reaction analysis physiological parameters

Description:

This standardized test indicates in which vegetative systems (circulatory system, skin conductance, muscle tone, etc.) the client shows the most marked response to stress. Furthermore, conclusions can be drawn on the temporal course of physical processes such as anticipatory anxiety and how stressful situations are handled.

Activation screening is divided into four phases:

- › Relaxation phase (baseline)
- › Preparatory phase
- › Confrontation phase with a stress inducer (visual and acoustic)
- › Relaxation phase

Required hardware:

- › All available sensors, if possible

BFBEL

Tolerance test



Areas of application:

- › Stress management
- › Psychosomatic complaints under stress
- › Psychophysiological resilience

Description:

It is the objective of the program to recognize how the client reacts in active stress situation.

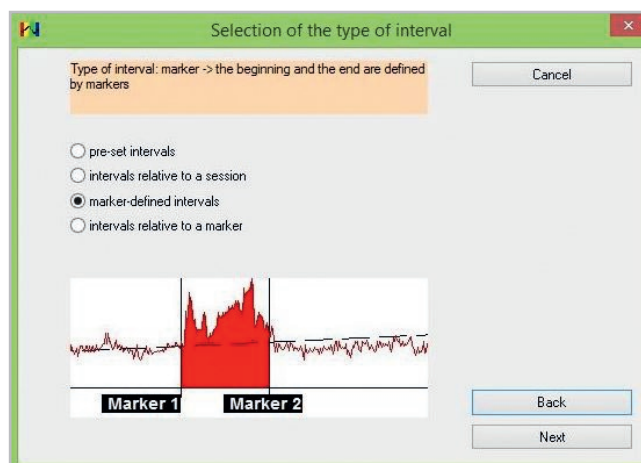
The client uses a mouse click to evaluate the shape of a geometric shape that moves on the screen, accompanied by an acoustic signal. The computer continuously adjusts the speed of the presentation to the current performance of the client. This creates the optimum level of persistent stress.

Required hardware:

- › All available sensors, if possible

BFSTAT

Statistics module



Description:

The statistics module can be used to prepare data acquired with Biofeedback Xpert for further statistical analyses with standard statistic programs. In the framework of studies, this makes it possible to make comparisons between different sessions, persons or also within a session.

The following settings are possible:

Intervals

Determine flexibly which intervals are of interest. Multiple selection methods are available: automatic marker-controlled, session-based and absolutely positioned intervals.

Measuring channels

Select the relevant measuring channels.

Interval indicators

Determine which indicators of the selected intervals should be calculated (mean, median, minimum, maximum, slope, standard deviation, etc.).

The program can smooth data and remove outliers during calculation. The data can be exported in a format for SPSS or tab-delimited (such as for Excel).

POINTS and sensors

Modular, portable and ergonomic: These advantages of the POINTs contribute to the success of training and enhance comfort and convenience during a session.

The POINTs are attached to the body close to the point from which the recording will be made. This means that only very short sensor cables are needed. The recorded signals are transmitted wirelessly (Bluetooth®). Up to seven POINTs can be used simultaneously with one computer, permitting great flexibility in the way that sessions are organized. In addition, the Multi Parameter Point has an integrated memory card for later analysis of the readings (data logger).

Simple plug-in connectors and easily attached sensors make the system easy to use and contribute to a relaxed setting.



MULTI-P

Technical indicators

Channels 4

Notch filter 50/60 Hz

BVP

Resolution 24 bit

Sample rate 1000 Hz

Integration time constant 200 ms

Heart rate 30...200 beats/minute

TEMP

Resolution 14 bit

Data rate 5 values per second

Measurement range 10 - 40 °C

Accuracy 0.5°C @ 0.01°C resolution

EDA

Resolution 16 bit

Sample rate 1 kHz

Range 0...100 µS

Accuracy 0.65 µS @ 0.059 µS resolution

MOT

Resolution 16 bit

Sample rate 100 Hz

Measurement range 0...20 m/s²

Accuracy 0.006 m/s² @ 0.05 m/s² resolution

HRV

Resolution 24 bit

Recording 3-pole, bipolar

Bandwidth 1.06 – 100 Hz @ 1000S/s sample rate

Measurement range +/- 3200 µV

RR interval 300 - 2000 ms



RESP-P

Technical indicators

Channels 1

Resolution 12 bit

Breathing frequency 0.02 – 60 ventilations/min

Measurement range

70 – 220 cm @ 0,1 mm resolution



EMG-P

Technical indicators

Channels 2

Notch filter 50/60 Hz & antialiasing filter 8th order

Resolution 24 bit

Input impedance At least 2GOhm

Reference voltage driven right leg circuit

Frequency range

25 – 80 Hz (slow twitch fibers)

25 – 200 Hz (slow + fast twitch fibers)

25 – 500 Hz (wide range)

100 – 200 Hz (fast twitch fibers)

2000S/s sample rate

Measurement range +/-2400 µV



Multi Parameter POINT (MULTI-P)

- › Skin conductance
- › Pulse
- › Temperature
- › Heart rate variability
- › Movement

Sensors



Sensor for skin conductivity, pulse, temperature and movement (MULTI-S2)

- › Finger
- › Application with Velcro tape



Sensor for skin conductivity, pulse, temperature, movement and heart rate variability (M-HRV-S)

- › Finger
- › Application with Velcro tape and disposable electrode

NEW: Measurement of the pulse transit time*



Sensor for heart rate variability (HRV-S)

- › Finger
- › Application with armband and disposable electrode



Sensor for skin conductance (SC-S)

- › Palm of your hand or finger
- › Application with disposable electrode



Sensor for migraine (MIG-S)

- › Head area
- › Application with headband



*Pulse transit time (PTT) measures the transit time of the blood wave from the R wave of the EKG up to the maximum of the BVP at the finger tip. PTT is considered an indirect measurement of blood pressure. The results are given in milliseconds.



Respiration POINT (RESP-P)

› Breathing measurement

Sensors



Sensor for breathing measurement
(RESP-SM)

› Chest or stomach area





EMG POINT (EMG-P)

› Electromyography

Sensoren



Sensors for muscle tension (EMG-S1/EMG-S2)

- › Respective muscle
- › Application with Velcro tape, clip or headband



EMG electrode cable (EMG-VR2)

- › Finger or head area
- › Application with Velcro tape or disposable electrode



Vaginal or rectal electrode (VAGINAL/REKTAL)

- › Vaginal
- › Rectal



NEW:
Sending the raw scores possible.

Quality management

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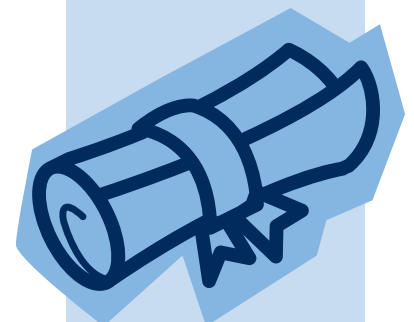
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Hidden Champion 3.0

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