BHM
Nice to hear You again

BHMFit contact*forte*

Instruction for Use

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1. Introduction

This document was created to help the hearing aid acoustician and authorised specialist to install the Fitting Software **BHMFit contact forte**, and consequently to provide information for fitting of the hearing system.

Reference is made to the fact that modifications to hearing systems may only be carried out by hearing aid acousticians or authorised specialists. The correct functioning of the hearing system depends crucially on correct fitting. Adaptations must be carried out with extreme caution so follow the instructions for use for the hearing systems and note the output level of the hearing systems.

2. System requirements

BHMFit contact forte is using a database that allows the efficient management of customer information:

- Customer contact information
- Session list
- Audiogram data

BHMFit contact forte can be used on systems that meet the following requirements:

Supported operating systems:

- Windows 7 - 32 & 64 Bit
- Windows 8.1 - 32 & 64 Bit
- Windows 10 - 32 & 64 Bit
- Windows Server 2008 - 32 & 64 Bit
- Windows Server 2010 - 32 & 64 Bit

Minimum requirements:

- PC with DVD drive or USB port
- Free hard disk space: 100 MB (Fitting Software) and 150 MB (Database)
- 4 GB RAM
- Screen resolution: 1024 x 768
- Programming interface: NOAHlink, HI-PRO, HI-PRO USB or HI-PRO2
- Programming cable
- Microsoft .NET Framework 4.5
- Adobe Acrobat Reader
- Microsoft Word (Export of the fitting protocol)

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3. Installation

Note: Administrator privileges are required to avoid installation problems.

- Close all running Windows applications before starting the installation. Other running programs or virus scanner could affect or block the installation.
- Open the **BHMFit contact forte** setup application to start the installation, if it does not start automatically.
- Follow the instructions on the screen.

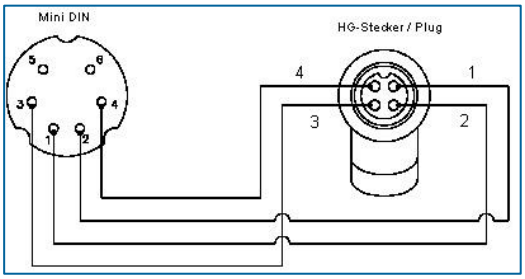
4. Connecting hearing system with programming interface

NOAHlink, HI-PRO, HI-PRO USB and HI-PRO2 is supported as a programming interface. The programming interface must be installed on your computer. For the installation, please use the documents and software from the manufacturer of the programming interface.

The programming socket on the **contact forte** is located at the bottom of the hearing system and is protected by a socket cover and a socket seal that must be removed before the programming cable is connected.

The socket cover and the socket seal provide protection from dust and moisture and must be reinstalled after fitting of the hearing system. Please refer to the device instruction for use for details.

Gently connect the programming cable to the programming interface with the Mini-DIN connector and to the hearing system with the 4-pin hearing aid connector. Please make sure that the red marking on the programming cable connector is on the same side as the yellow marking on the programming socket. Otherwise, you will have no connection i.e. may destroy the programming socket! The hearing system must always be turned off when connecting and unplugging the programming cable.



Please remove the battery during the programming process.

Programming cable:

Use a cable with the standard wiring as per HIMSA specification, or a compatible cable.
Examples of compatible programming cables:

- Beltone: 902290769029
- Siemens: Connex 3
- Oticon: No. 3
- BHM: 77733408 (VBK No. 99/150-RED right)
- BHM: 77733409 (VBK No. 99/150-BLUE left)

The **contact forte** may only be programmed with the programming interfaces and programming cables mentioned above. If unauthorized programming interfaces and programming cables are used, there is a risk of injury to patients and damage to the hearing system.

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5. User interface

5.1. Sections

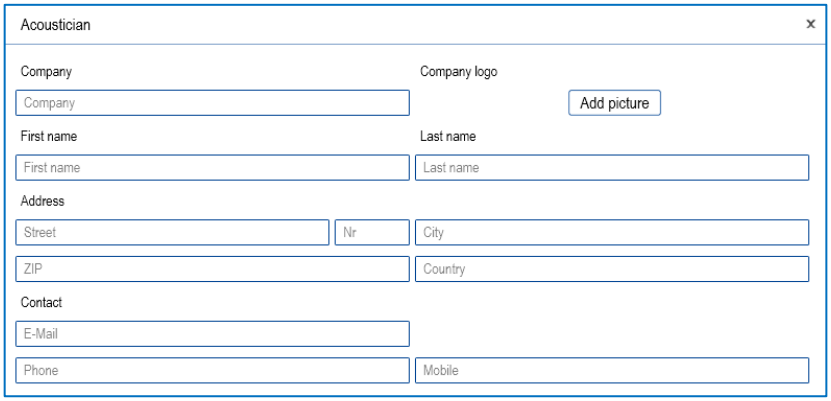
5.2. Menu bar

File

- *Import data* information from BHMFit contact, BHMFit2 or NOAH (NOAH XML File)
- *Export data* information to NOAH (CSV File)
- *Close* the program

Settings

- *Acoustician data* can be entered and saved. Data will be shown on the fitting report and on the customer's info page.



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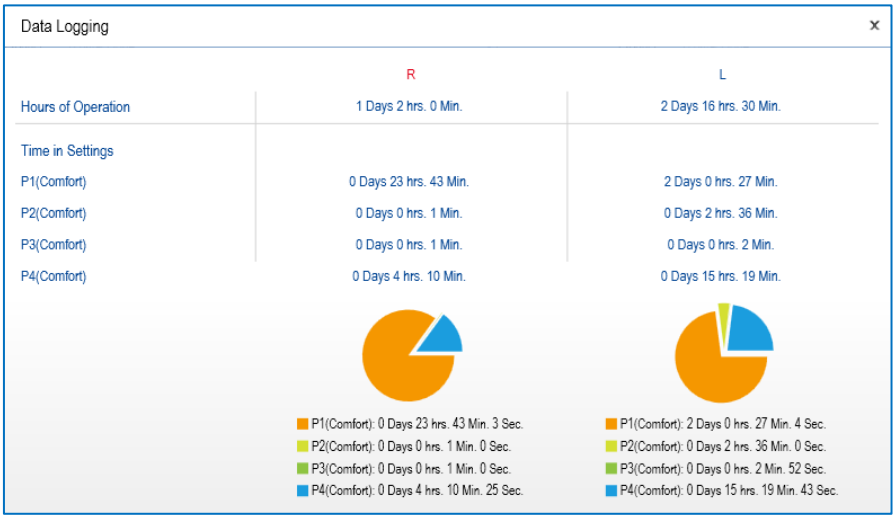
- *Programming device* setting. Select between HI-PRO or NOAHlink.
- *Factory settings.* The hearing system is restored to the factory settings.
- *Language.* Select the language of the software.

Data logging

- *Show logged data* of the device usage.



To show out the logged data, the “data logging” option must be enabled. See chapter 6.4. “Options“.

Help

- *Instruction for Use*
- *About…*

5.3. Navigation menu / Navigation button

The navigation menu guides the user step-by-step through the fitting session. The individual menu items can be selected directly or accessed with the "Navigation button" (bottom right) during a systematic fitting procedure.

The active menu is underlined and the completed menus are greyed-out. It is always possible to make a step back in the menu.

5.4. Working section

The main settings and entries for the fitting session can be made in the working section. Different setting options depending on the navigation menu items are possible.

The various setting and selection options related to the respective navigation menu item are described in the chapter “Fitting procedure”.

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5.5. Actions bar

In the actions bar, various options are offered as part of the fitting session in the various navigation menu items.

The various action options related to the respective navigation menu item are described in the chapter “Fitting procedure”.

5.6. Status bar

The status bar displays the following:

- Connection status of the hearing system on the right side
- Connected / selected hearing system on the right side
- Connection status of the programming interface
- Connection / selected programming interface
- Connected / selected hearing system on the left side
- Connection status of the hearing system on the left side

The following status information is displayed:

The hearing system / the programming interface is not connected.

The hearing system / the programming interface is connected.

The green status indicates that the settings configured in the software have been transferred to the hearing systems but have not yet been permanently programmed. Permanently programming in the hearing systems is performed at “Finalization” executing “Program and save”. See chapter 6.5.

5.7. Features bar

In the features bar, various features are offered as part of the fitting session in the various navigation menu items.

The various action options related to the respective navigation menu item are described in the chapter “Fitting procedure”.

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6. Fitting procedure

6.1. Customer management

Customer management appears at the start of every hearing system fitting. This is where the following customer data can be managed:

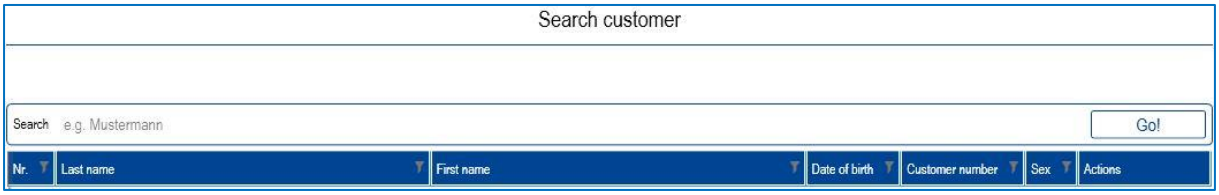
- Personal data
- Audiogram data
- BC audiometer function (In-Situ)
- Sessions list

Actions bar

6.1.1. Search customer

With the following action buttons, customers from the list can be selected or deleted.

An additional customer search option is also available.



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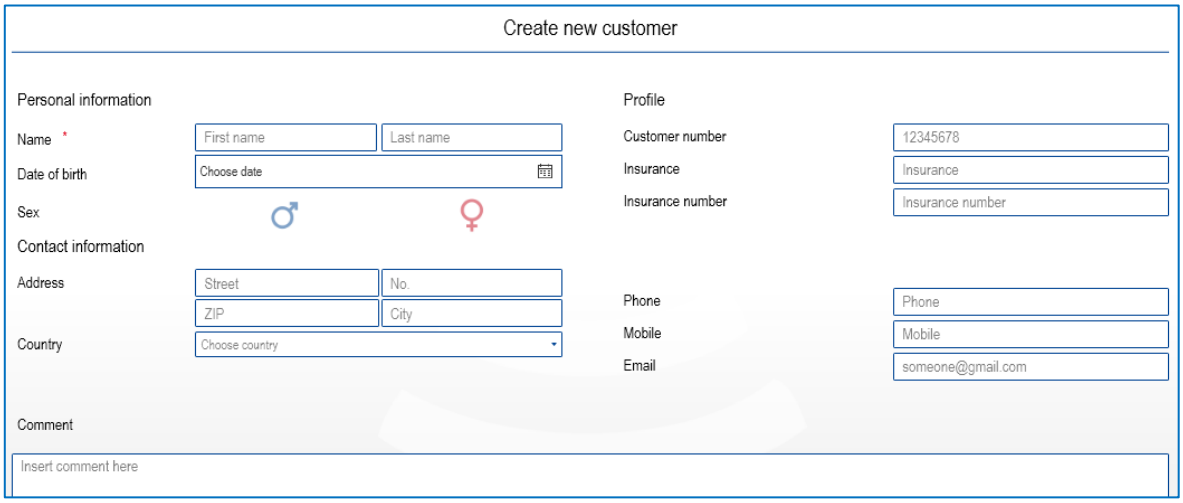
6.1.2. Create new customer

New customer can be created.

When you create a new customer, the “Create new customer” data view will appear. Here, the customer data can be entered.

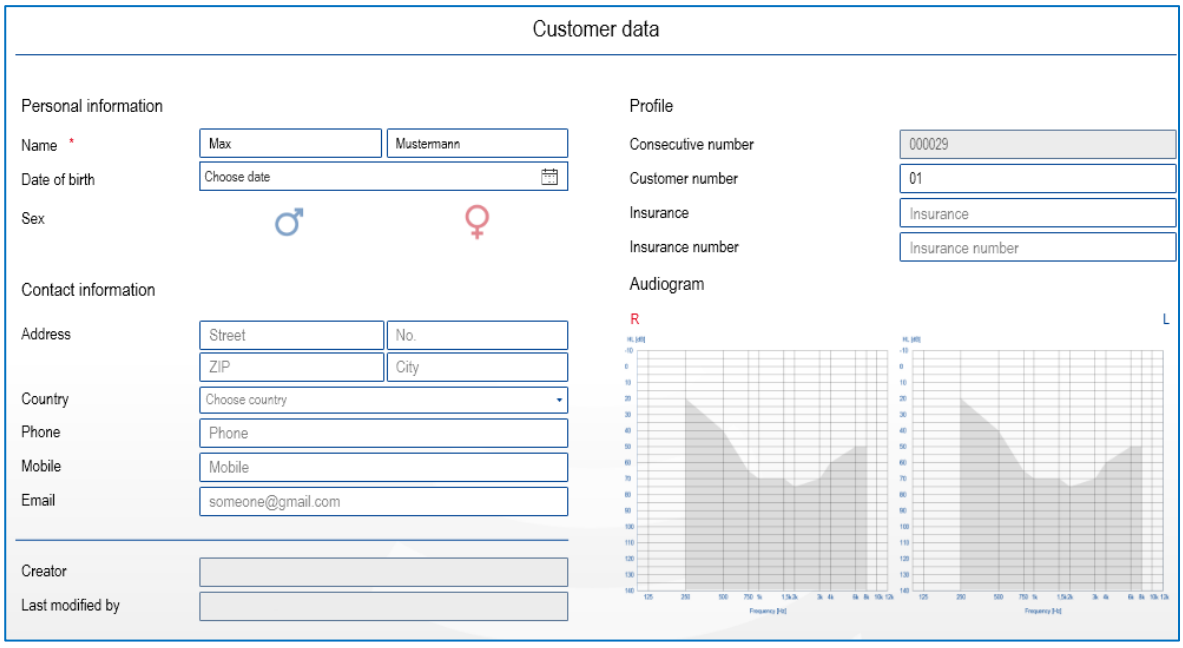


Save the entered customer by clicking the “Save” button at the features bar. The customer will be added to the customer database.

To create and save a customer, you need to enter at least the first name and the last name.

6.1.3. Customer data

Once a customer was created or selected, the customer data can be edit in the “Customer data” view.



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Add a comment

Add a comment to the customer by clicking the “Comment” button at the features bar. Once you have entered a comment, a red dot will appear at the comment button.

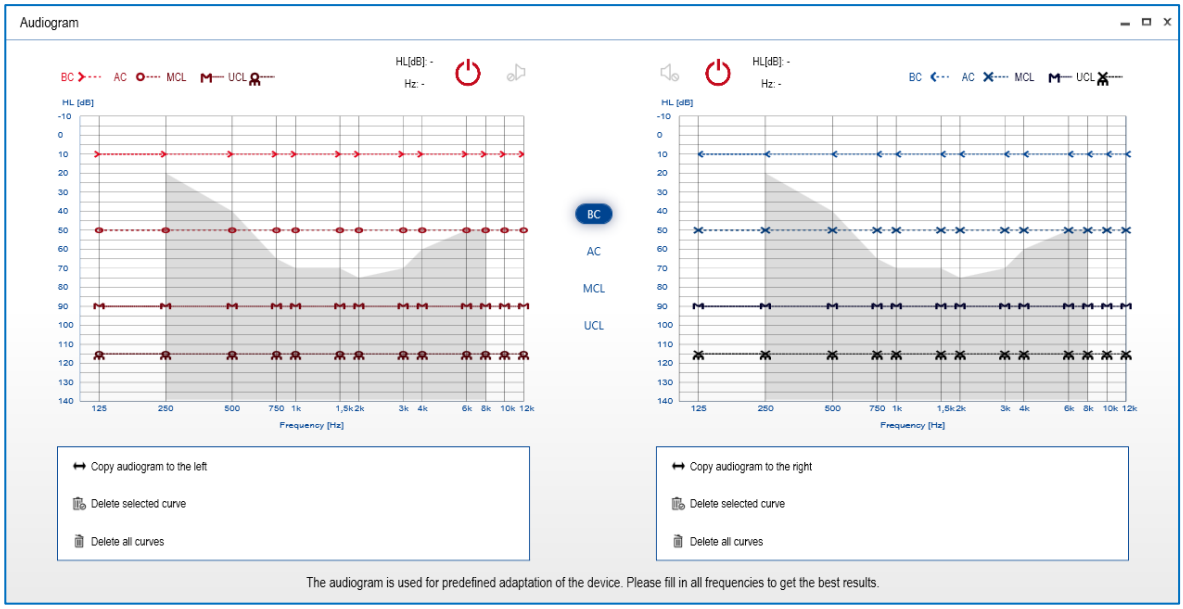
Entering an audiogram

Enter or edit the customer audiogram by clicking the “Audiogram” button at the features bar or by double-clicking the audiogram display at the customer data view.

The following threshold values can be entered:

- BC – Bone conduction threshold
- AC – Air conduction threshold
- MCL – Most comfortable level
- UCL – Uncomfortable level

Selecting BC, AC, MCL or UCL enables data to be entered into the audiogram. Set data points with left-click or return key at the desired frequency and hearing loss position. The data for the right ear (RED) is entered in the graph on the left and the data for the left ear (BLUE) in the graph on the right.
Delete data points again by right-click or backspace key.



Additional features:

- *Copy audiogram to the left/right* – copies the audiogram from one side to the other
- *Delete selected curve* – deletes the audiogram data points from the selected curve
- *Delete all curves* – deletes the audiogram data points from all curves entered from one side

Save the entered audiogram data by clicking the “Save” button.

A hearing loss must not be entered for every frequency. For First-Fit calculation (see chapter 6.3.) the BC threshold data for the frequencies 500 Hz, 1 kHz, 2 kHz and 4 kHz must be set.

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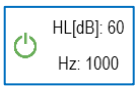
BC audiometer function (In-Situ)

A pure tone stimulus can be used during the hearing systems fitting.

After entering the audiogram the output of the hearing systems will be muted. To allow any communication with the customer, it is possible to unmute the output of the hearing systems by clicking the button.

The “In-Situ Start” button starts the BC audiometer (In-Situ) function. If no device has yet been detected, the device will now be connected.



Position the mouse cursor to the desired frequency and hearing loss. Turn on/off the pure tone stimulus by pressing the space bar. The **red OFF button** at the top of the audiogram will turn into a **green ON button** and values of the pure tone stimulus will be shown.

The grey area in the audiogram mark the maximum HL output level for the BC audiometer function. If the maximum level is reached, a message will be shown.
For setting the measured data points, see section above.

The BC audiometer function is only executable for the detection of the bone conduction hearing threshold level.

Open session list

Open the session list by clicking the “Sessions” button at the features bar.

In the session list a new session can be created, or a previous saved session can be loaded or deleted. The session list can also be closed with the button “Cancel“.

If no saved session is selected, a new session is automatically created whenever the next navigation menu point is clicked. A session can only be saved at the end of the fitting procedure executing “Program and save”. See chapter 6.5.

Navigate to “Devices”

Go to the next navigation menu point by clicking the “Devices” navigation button. This can also be done by clicking the “Devices” item at the navigation menu.

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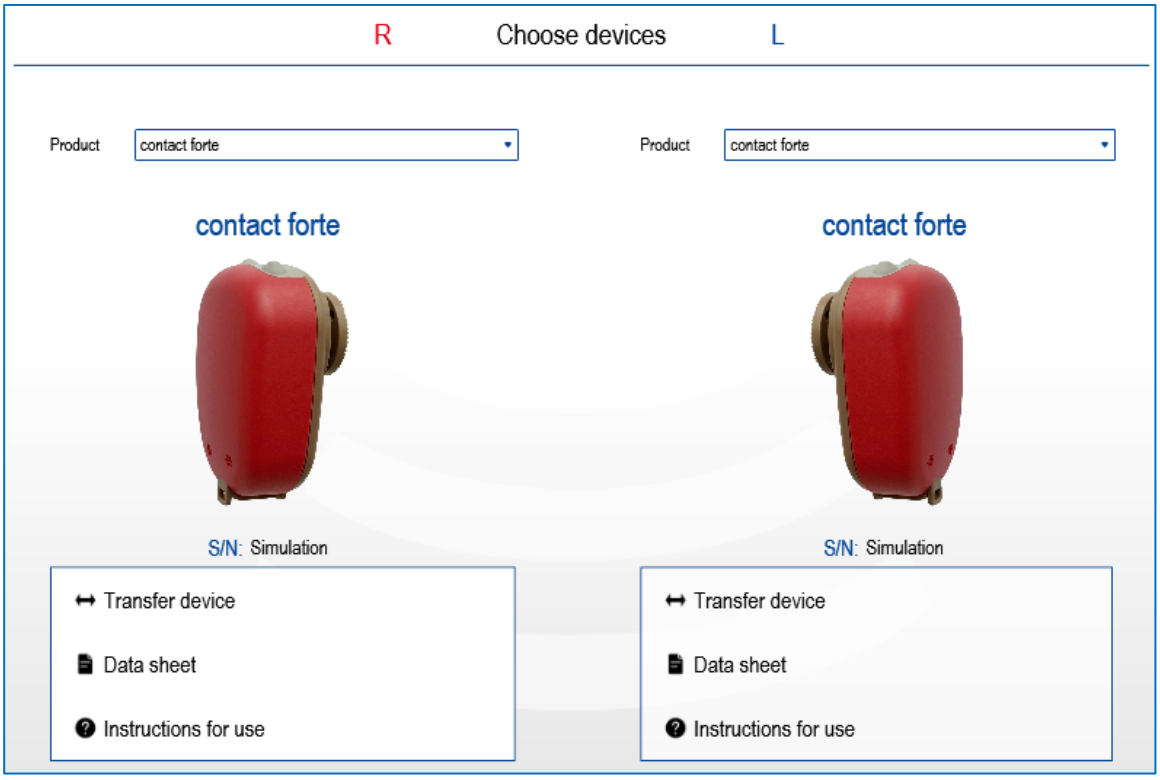
6.2. Devices

The hearing systems used for the fitting must be selected. This can be done automatically by detecting connected hearing systems (the hearing systems must be connected to the programming interface with a suitable programming cable – see chapter 4.) or manually by executing the simulation mode.
The detected hearing systems will be displayed with the serial numbers for the respective side (right/left). In simulation mode the word “Simulation” is shown instead of the serial number.



Actions bar

Detect:
A detection of the devices, after the simulation mode has been selected, is possible.

Additional features:
Transfer device from one side to the other side (only in simulation mode)
Data sheet of the selected device
Instruction for Use of the selected device

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First-Fit

Execute a fast fitting by clicking the “First-Fit” button at the features bar. Certain values must be entered at the audiogram to run First-Fit. For more information see chapter 6.3.

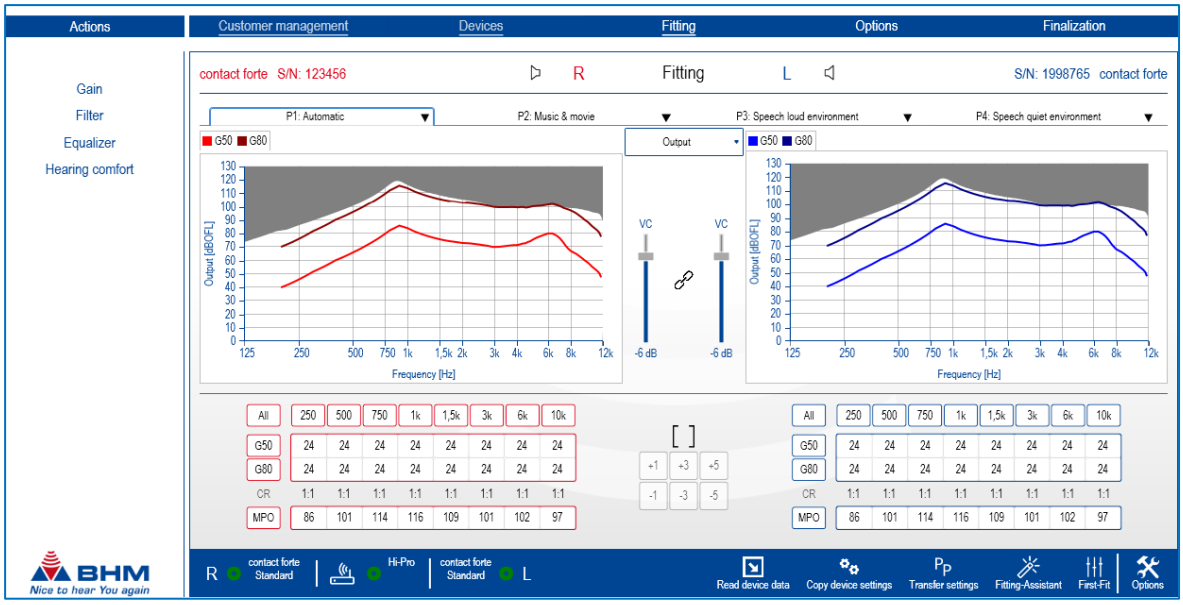
Navigate to “Fitting“

Go to the next navigation menu point by clicking the “Fitting” navigation button. This can also be done by clicking the “Fitting” item at the navigation menu.

6.3. Fitting

The following settings can be configured for the hearing systems individual programs in the "Fitting" section:

- Program modes with the corresponding input modes (Front-End Modi)
- Gain (G50, G80, MPO)
- Volume Control
- Filter (Low-cut, High-cut, Notch)
- Equalizer
- Hearing Comfort (Feedback Cancellation, Noise Reduction)
- Read device data
- Copy device settings
- Transfer program settings
- Fitting-Assistant
- First-Fit



Mute/Unmute

The signal output of the hearing systems can be switched off (mute) or switched on (unmute) during the fitting session by clicking the Mute/Unmute button.

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Couple/Decouple

Only possible at binaural fitting of hearing systems.

Hearing systems are decoupled. Changes at one hearing system at one side will not affect the hearing system on the other side.

Hearing systems are coupled. Changes at one hearing system at one side will also affect the hearing system on the other side.

Program selection

Up to 4 programs can be configured – P1, P2, P3 and P4. A click at the arrow on a given program opens a drop-down menu from which the desired pre-defined hearing program modes can be selected.

The following pre-defined hearing program modes are available. Each program mode is pre-defined with a Front-End mode.

Program mode	Front-End mode	Available for			
		P1	P2	P3	P4
Not active	-	No	Yes	Yes	Yes
Automatic*	Microphone	Yes	No	No	No
Music & movie	Microphone	Yes	Yes	Yes	Yes
Comfort	Adaptive directivity	Yes	Yes	Yes	Yes
Speech loud environment	Adaptive directivity	Yes	Yes	Yes	Yes
Speech quiet environment	Adaptive directivity	Yes	Yes	Yes	Yes
Phone acoustic	Microphone	Yes	Yes	Yes	Yes
BT	Bluetooth	No	Yes	Yes	Yes
BT + M (Omni)	Bluetooth + microphone	No	Yes	Yes	Yes

All program modes have to be fitted manually. Only the Front-End mode is pre-defined for every program mode.

<u>* Automatic</u>

In Automatic mode, the signal received by the microphones is analysed and categorised into different hearing situations. These are:

- Quiet environment
- Speech in quiet environment
- Loud environment

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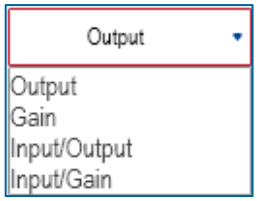
- Speech in loud environment
- Musical environment
- Windy environment

The parameters of the hearing system are always configured according to this categorisation such that an optimal level of hearing comfort and optimal speech comprehension are attained.

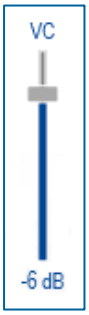
Display

By clicking at the drop-down menu, between the two graphical displays, the view mode can be chosen.

- Output
- Gain
- Input/Output
- Input/Gain

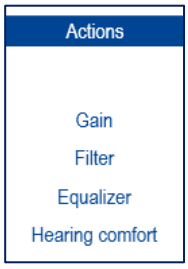


VC (Volume control)



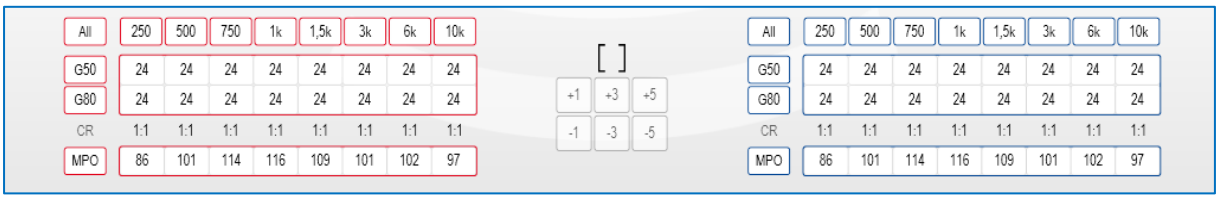
The “VC” slider allows to adjust the hearing systems output volume in 2 dB steps from -32 dB to 0 dB.

Actions bar



6.3.1. Gain

The gain and maximum power output (MPO) for the hearing systems can be set for eight frequency channels via a gain matrix. The values of the cells selected can be increased and decreased.



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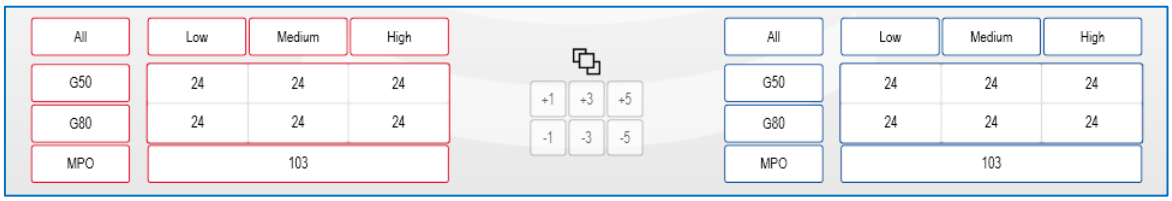
The gain matrix view can be simplified by clicking on the [ ] button.



G80 / G50 gain:

Select the gain values to be changed:

- Select individual gain values in the matrix by clicking on a cell or dragging the cursor over several cells.
- The "All" button selects all cells.
- The "G80" and "G50" buttons select the entire row.
- Clicking on the frequency selects the entire column.

It is possible to increase or decrease the gain values in 1, 3 or 5 dB steps by clicking the appropriate button next to the gain matrix.

The compression ratio is adjusted automatically according to the gain settings for the G80 and G50 values.

It may be the case that values cannot be increased or decreased when setting the gain via the gain matrix. Possible reasons for this:

- The minimum or maximum gain has been reached.
- The value for G50 cannot be less than G80.
- The value for G80 cannot be greater than G50.
- The compression inside the channel cannot exceed ∞:1.

MPO (Maximum Power Output):

The MPO (Maximum Power Output) limits the output force level of the hearing systems. Force levels exceeding the selected threshold are restricted. The maximum output signal level can be reduced in 1, 3 or 5 dB steps with the MPO by clicking the appropriate button next to the gain matrix. It is possible to adjust the MPO for every single frequency channel.

6.3.2. Filter

The following filter settings can be configured.

- High-cut filter
- Low-cut filter
- Notch filter

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High-cut filter:

The high-cut filters high frequencies above a selectable frequency. It is disabled when the slider is on the right. Otherwise, it is possible to select a limiting frequency between 8000 Hz and 1000 Hz. This function has proven very effective in practice at suppressing unwanted, high frequency signal parts and disturbing noises.

Low-cut filter:

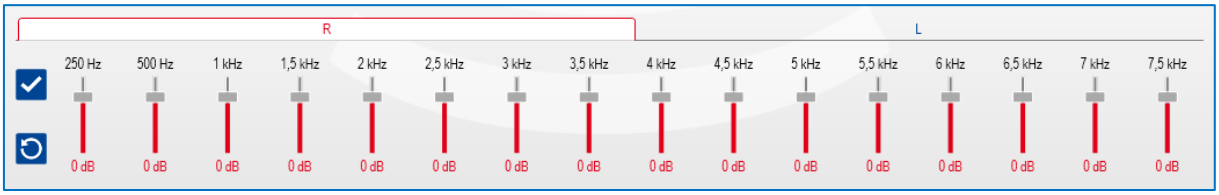
The low-cut filters low frequencies below a selectable frequency. It is disabled if the slider is on the left. Otherwise, it is possible to select a limiting frequency between 125 Hz and 2000 Hz. This filter reduces the maximum output level at low frequencies. In most cases, this results in considerably clearer sound reproduction and improved speech intelligibility. The power consumption of the hearing system is also reduced.

Notch filter:

The notch filter filters out frequencies within a narrow frequency range. The notch filter can be used to attenuate unwanted feedback and interfering frequencies by reducing the signal level of the relevant frequency. By clicking the button the notch filter can be activated or deactivated. The amount by which the gain can be adapted is between +10 and -30 dB in 2 dB steps. The relevant notch filter's centre frequency can be selected between 1000 Hz and 11500 Hz. The width of the notch filter can be defined according to the quality factor between 0.5 and 100.

6.3.3. Equalizer

The hearing systems have a 16-band equalizer. The equalizer allows high-precision correction of hearing loss. Each of the equalizer sliders alters the gain in the corresponding frequency band. The level for the selected frequency can be lowered or raised using the appropriate slider.



There are separate equalizers for left and right. By clicking at the appropriate tab the equalizer function for the right side (red) or left side (blue) will be chosen.
The default value for the equalizer frequency bands is 0 dB. It is possible to change the gain in the range -18 dB to +6 dB for every frequency band.

Each frequency band can be changed separately with the appropriate slider.
Additional it is possible to combine single frequency bands by clicking at the dB-values at the bottom of the frequency bands. Combined frequency bands would be marked with a tick.
By clicking the button all frequency bands will be combined.
By clicking the button all frequency bands will be reset to default values.

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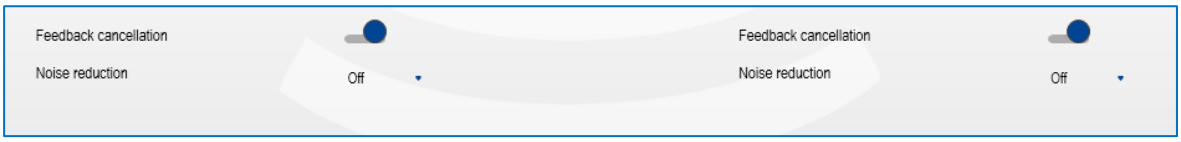
6.3.4. Hearing comfort

The hearing comfort section provides the following options for reducing feedback and background noise:

- Adaptive feedback cancellation
- Adaptive noise reduction



Adaptive Feedback Cancellation:

The hearing systems have adaptive acoustic feedback management. Acoustic feedback, whistling, etc. are automatically minimised once the suppression of feedback is enabled. The gain of the hearing systems remains unaffected and is not reduced.

Adaptive Noise Reduction:

The hearing systems are able to reduce irritating noises and artefacts by means of noise reduction. It is particularly effective when the customer is dependent on good speech understanding in an acoustic environment with a wide range of background noise.

The following levels can be selected:

- Off – no noise reduction
- Low – noise reduction of 3 dB
- Moderate – noise reduction of 6 dB
- High - noise reduction of 9 dB

Read device data

Reading out the settings from the hearing systems by clicking the "Read device data" button at the features bar.

Copy device settings

Copying the current settings from one hearing system to the other hearing system by clicking the "Copy device settings" button at the features bar. This function is only possible for binaural fitting.

Transfer settings

Transferring the current settings from one program to another program by clicking the "Transfer settings" button at the features bar. For binaural fitting it can be decided to transfer the settings only in one hearing system (left or right) or in both hearing systems.

Fitting-Assistant

Opening the Fitting-Assistant by clicking the “Fitting-Assistant” button at the features bar. The Fitting-Assistant helps to fine-tune the hearing systems to customer requirements in realistic situations. Here you will find examples from everyday situations, such as "Traffic noise too loud", and with suggestions for personal optimisation.

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Procedure:

- Selecting the desired category:
    - Comfort
    - Sound quality
    - Speech intelligibility
- Selecting the respective situation, like “Voices too loud”, ...
- Selecting one of the suggested possible solution.
- Executing the suggested solution for the left, for the right or for both hearing systems.

Every action can be undone by clicking the “Undo” button.

Once the desired selection is executed, a message “Changes applied” will appear next to the execute buttons. All executions will be carried out immediately.

First-Fit

Selecting and executing a fitting algorithm by clicking the "First-Fit" button at the features bar. It can be selected between the following fitting algorithms.

- BHM-BC-Fit
- BHM-BC-NL (unilateral or bilateral consideration)

The fitting targets of the algorithms will be shown as dashed lines in the display of the output and gain graph in the main window.

To execute a First-Fit algorithm, at least the 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz bone conduction (BC) audiogram values have to be entered at the audiogram. The more data points are set, the more accurate the First-Fit calculation will be. All other threshold data are optional and have no influence on the First-Fit calculation.

Navigate to “Options”

Go to the next navigation menu point by clicking the “Options” navigation button. This can also be done by clicking the “Options” item at the navigation menu.

6.4. Options

The following settings are available in the options section:

- Signal sounds activation/deactivation
- Volume of signal sounds
- Data logging activation/deactivation
- Startup delay
- Key lock activation/deactivation
- Wireless connection activation/deactivation

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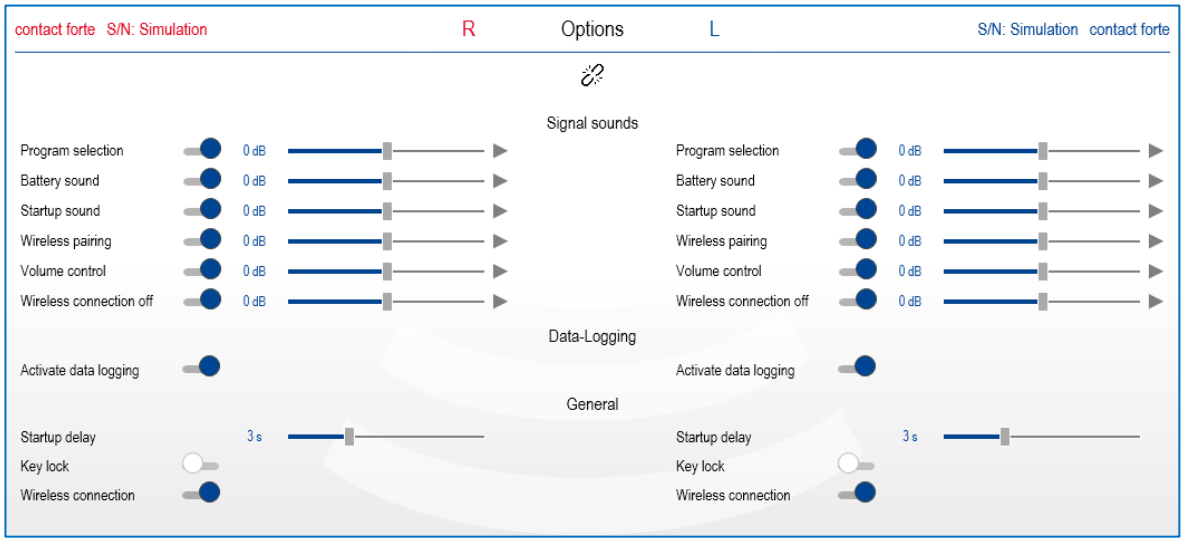

Mute/Unmute

The signal output of hearing system can be switched off (mute) or switched on (unmute) during the fitting session by clicking the Mute/Unmute button.

Couple/Decouple

Only possible at binaural fitting of hearing systems.

Hearing systems are decoupled. Changes at one hearing system at one side will not affect the hearing system on the other side.

Hearing systems are coupled. Changes at one hearing system at one side will also affect the hearing system on the other side.

Signal sounds

The signal sounds section allows the individual volume setting or deactivation of the following:

- Program selection
- Battery sound
- Startup sound
- Wireless pairing
- Volume control
- Wireless connection off

The “On/Off” button allows signal sounds to be activated or deactivated.

The “Volume” slider allows to adjust the signal sounds volume in 6 dB steps [-12 dB, -6 dB, 0 dB, +6 dB, +12 dB].

The “play” button allows signal sounds to be played directly on the connected hearing system.

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Data logging

Activate data logging can be switched on or off. If data logging is activated, the customer's usage behaviour and program use will be recorded. This data can be read out and displayed under "Data Logging" in the menu bar.

General

- Startup delay

The startup delay defines the number of seconds to delay between when initialization completes and application processing begins. The startup signal sounds after the specified startup time.

- Key lock

Activate or deactivate the control buttons of the hearing system.

- Wireless connection

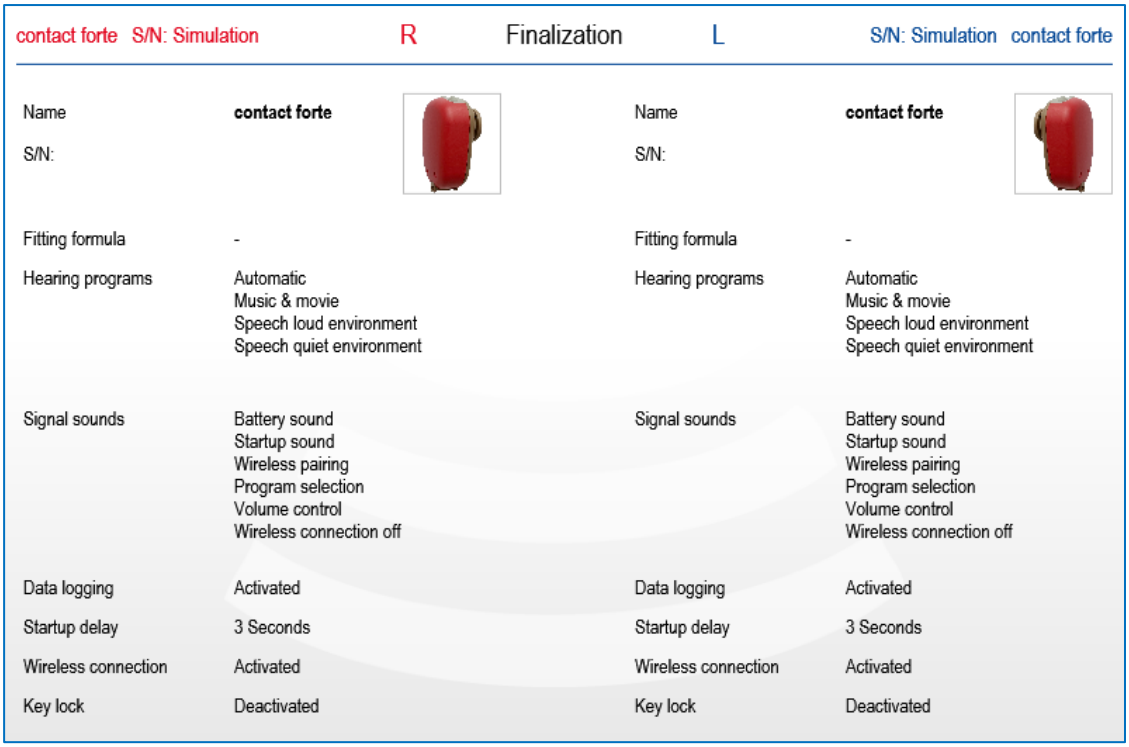
Activate or deactivate the Bluetooth connectivity functions.

Navigate to "Finalization"

Go to the next navigation menu point by clicking the "Finalization" navigation button. This can also be done by clicking the "Finalization" item at the navigation menu.

6.5. Finalization

Before the adjusted settings are programmed to the hearing systems and the session is saved, the main settings are once again displayed in an overview.



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The following functions are available at this point:

- *Session notes*
- *Print information sheet*
- *Print report*

Session notes

Add some comments to the actual session by clicking the “Session notes” button at the features bar. Once you have entered a comment, a red dot will appear at the comment button. The entered text will appear in the print information sheet and in the print report.

Print information sheet

Print an information sheet by clicking the “Print information sheet” button at the features bar. This sheet contains information about the hearing systems used and a few points that will be useful to the customer (such as hearing program assignment). The information sheet can be print to file (.pdf format) or can be print directly.

Print report

Print a fitting report by clicking the “Print report” button at the features bar. The fitting report contains both customer data and all the settings configured on the hearing systems fitted during the session. The fitting report can be print to file (.pdf format) or can be print directly. A session name can be defined and will appear in the fitting report. The defined session name will be automatically assumed to the “Program and save” window.

Program and save

Programs the fitting data and settings to the hearing systems and saves the customer session. Clicking on the “Program and save” button offers the following save options: save the session to the customers data base (a session name can be defined optional), save the settings to the connected hearing systems, or both.
After selecting the save options it is possible to save and exit the fitting software or to save and start a new session.

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7. Key

Symbols	
	Warning! Pay attention to the warnings notices in these instruction for use
	Important information for usage and product safety
	CE marking and Notified Body number
	Manufacturer
	Consult instruction for use

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