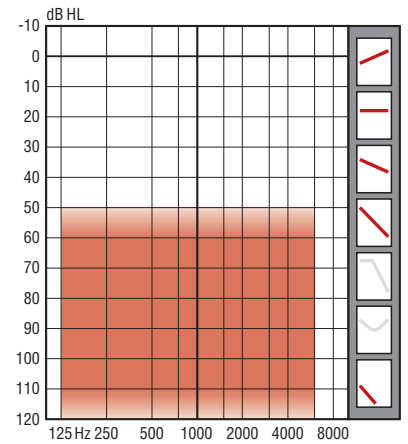




**Fitting range**



**General information**

SUMO XP is a very high power programmable BTE instrument, designed for people with severe and profound hearing losses.

Highly flexible filtering enables SUMO XP to fit a wide range of severe and profound hearing loss configurations. This reduces the requirement for a variety of power instruments to fit these losses.

SUMO XP features a unique 2-stage feedback management system. The first stage calculates a safe feedback margin when calculating prescribed settings. The second stage incorporates a variable roll-off feedback mechanism to enable fine tuning of the response to suit each individual earmold. The system enables the instrument to be used at maximum VC levels without feedback, while preserving essential high frequency gain at lower VC settings.

SUMO XP also has a Battery Manager for longer battery life and to ensure that a high sound output is maintained throughout the life of the battery.

**User groups**

- Most types of sensorineural, conductive and mixed hearing losses in the categories of severe and profound
- People with high demands on accessories, ergonomics, cosmetics, and compatibility with DAI/FM accessories

**User benefits**

- Optimal use of residual hearing
- Clear sound quality and low distortion
- Small size
- Long battery lifetime with sustained high output levels

**Dispensing features**

- Straightforward fitting procedure
- Flexible fitting for profound HL
- Simple, effective 2-stage feedback management
- Supported by Noah / Genie and EasyFit II stand alone programmer
- Standard Oticon programming cable (#3)

**Warning to hearing instrument dispensers**  
 The maximum output capability of this hearing instrument may exceed 132 dB SPL. Special care should be exercised in selecting and fitting the instrument as there may be risk of impairing the remaining hearing of the hearing instrument user.

**Standard features**

- MPO: 146 dB SPL / Peak gain: 85 dB
- Digitally programmable
- A-Gram Slope control (4th order LF/HF cut)
- Variable Crossover Frequency (.5-2.0 kHz)
- Gain control (pre set)
- UCL control with 3 output limiting options:  
 PC, AGCo Fast and AGCo Slow
- Feedback Manager (variable roll-off)
- Programmable telecoil
- Telecoil boost (+6 dB)
- Programmable VC range: Full (30 dB), half (15 dB) and disabled
- Un-damped sound hook
- DAI
- FM compatible
- Colors: beige, light brown, dark brown, light grey, dark grey, black and kids colors
- Fitting rationales: POGO II+BC (default), NAL-RP, DSL i/o, SSM+ and CoreII-2

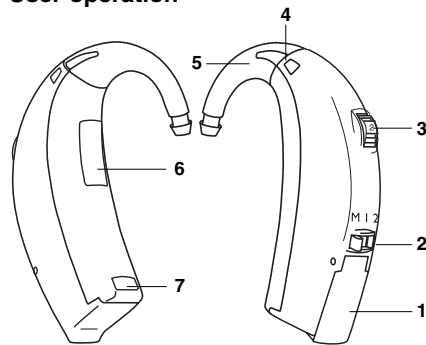
**Options and accessories**

- Hooks:
  - 5 dB damped
  - Paediatric
- Interlocking DAI and FM shoes
- Tamper-resistant battery drawer
- Spectacles adaptor
- CROS and BI-CROS
- Bone conduction oscillator
- Left / Right identification

# FITTING INFORMATION

## SUMO XP

### User operation



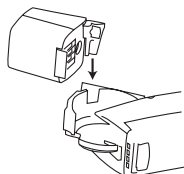
- 1 Battery drawer and built-in on-off switch
- 2 Telecoil switch (programmable M-MT-T)
- 3 Volume control
- 4 Microphone opening
- 5 Click hook
- 6 Number plate
- 7 Right (red) and Left (blue) identification

### Dispenser operation

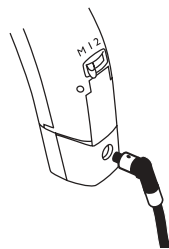
SUMO XP is programmed using the Genie fitting software compatible with NOAH 2.0 and 3.0 or the EasyFit II programmer. The cables used are the same for either programming device.

Programming shoe . . . . . no. 390-01-320-04  
 HI-PRO cable # 3 Right (Red) . . no. 384-20-014-00  
 HI-PRO cable # 3 Left (Blue) . . no. 384-20-015-01

### Connecting the Programming shoe



- 1 Open the battery drawer on SUMO XP and slide the programming shoe into the guide as shown. Insert battery.



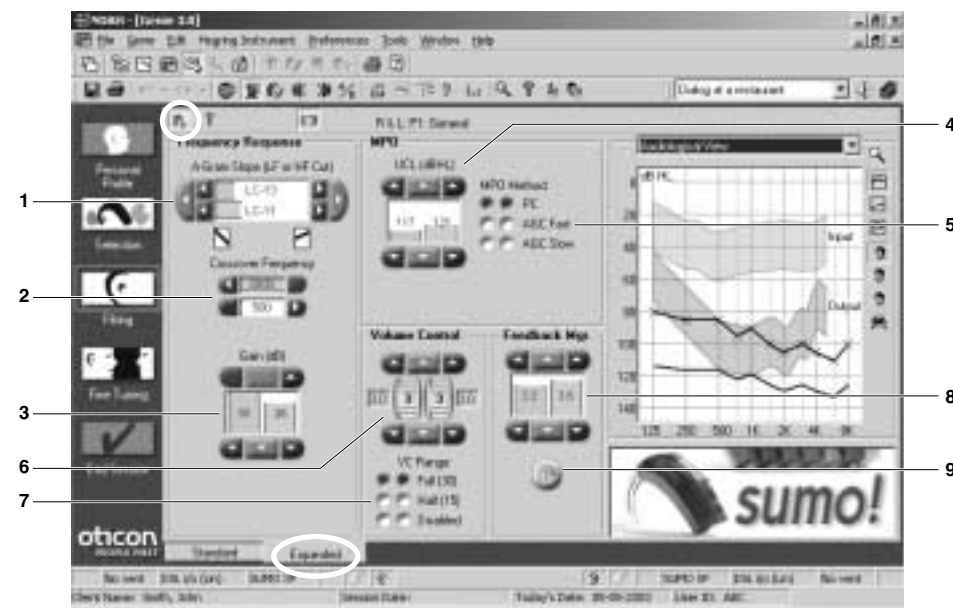
- 2 Close the battery drawer and attach the HI-PRO cable ensuring that the red dot on the plug matches the red dot on the shoe. **Do not twist the plug!**

During programming, the instrument must be switched on, and in M-position.

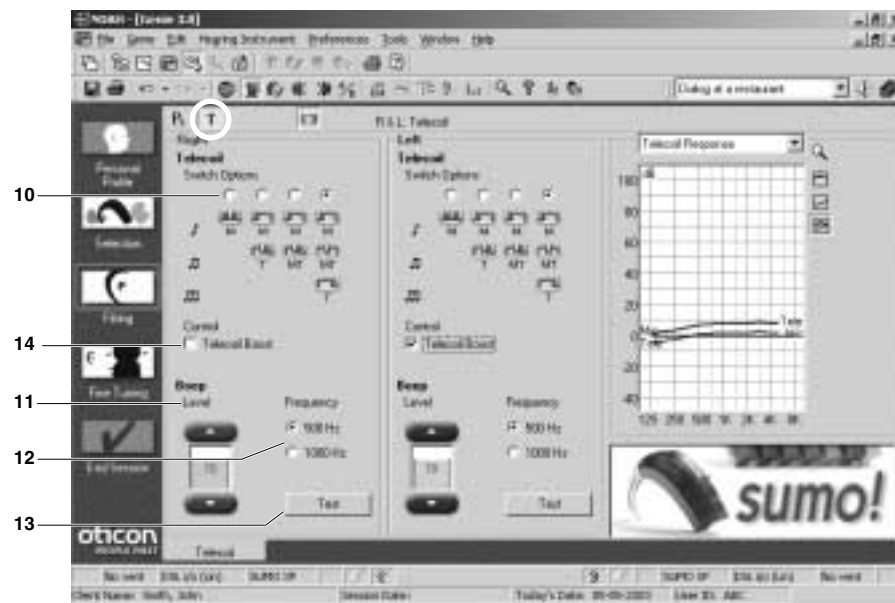
### Fitting controls in Genie and EasyFit

The calculated prescribed settings for SUMO XP are based on standard rationales for linear instruments. The options are POGO II+BC, NAL-RP, DSL i/o, SSM+ and Corell-2. Default rationale is POGO II+BC. POGO II has been revised to include the Air-Bone gap in the prescription. The gain compensation for conductive and mixed hearing losses is 1:1 for the conductive element. The prescribed setting will in most cases provide a good fit. Further adjustments can, if necessary, be made via the Fitting step or the Fine Tuning step.

#### Genie



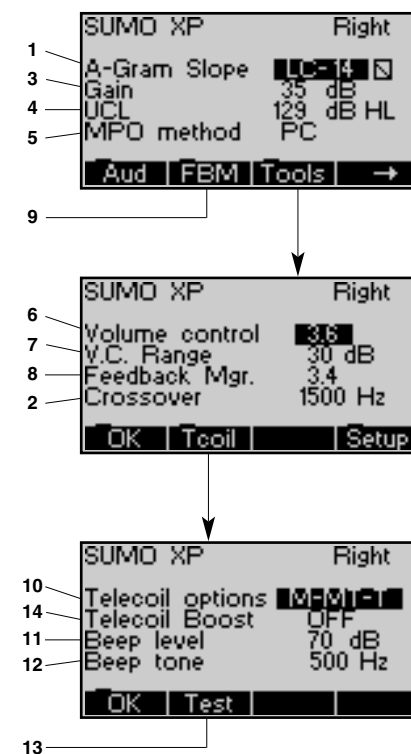
In Genie, the fitting controls are structured in a 'Standard' panel with controls that are commonly used and an 'Expanded' panel where all fitting controls are displayed (shown in this example). To access the controls, click Fitting in the Genie Organizer and P1 in the sub-tool bar.



The Telecoil screen is accessed by clicking T in the sub-tool bar.

- 1 **A-Gram Slope** cuts low (LC) or high (HC) frequencies according to the overall slope of the audiogram.
- 2 **Crossover Frequency** adjusts the frequency around which the A-Gram Slope cuts the low and high frequencies. This feature may be used to fine tune the frequency response or to ensure that the feedback management system works under optimum conditions.
- 3 **Gain** adjusts the preset gain of the instrument. Ideally this should be set to a comfortable level when the volume control is around 3. This will leave the user with approximately 10 dB reserve gain.
- 4 **UCL (dB HL)** adjusts maximum power output (MPO) according to the user's uncomfortable level.
- 5 **MPO Method** provides three output limiting options:  
**PC:** Peak clipping, where the highest possible output is needed, i.e. profound hearing losses.  
**AGC Fast:** Fast acting output AGC, functions as a traditional AGC+PC combination giving low distortion output limiting.  
**AGC Slow:** Output AGC+PC combination with slow attack time, giving comfortable low distortion output limiting with minimal pumping effect.
- 6 **Volume Control** allows on-screen adjustment of the instrument's volume control during the fitting. Manual operation overrides the on-screen setting of the volume control.
- 7 **VC Range** sets the available range of the volume control. Choices are Full (30 dB), Half (15 dB) and Disabled (no range). Default range is Full. Before reducing the range, make sure that appropriate gain is fitted in the Full range, and that VC is set to preferred level. Reduced VC range may help people with dexterity problems.
- 8 **Feedback Manager (FBM)** eliminates acoustical feedback by reducing the HF gain at higher volume control levels. The value in the FBM-window indicates the volume control level above which the high frequency gain will not be increased. The prescribed algorithm pre-sets the FBM to avoid feedback when the fitting session is opened. It is strongly recommended to test for feedback at higher VC settings before the fitting session is ended. If required, use the 'FBM' icon/button or adjust manually to prevent feedback.

#### EasyFit

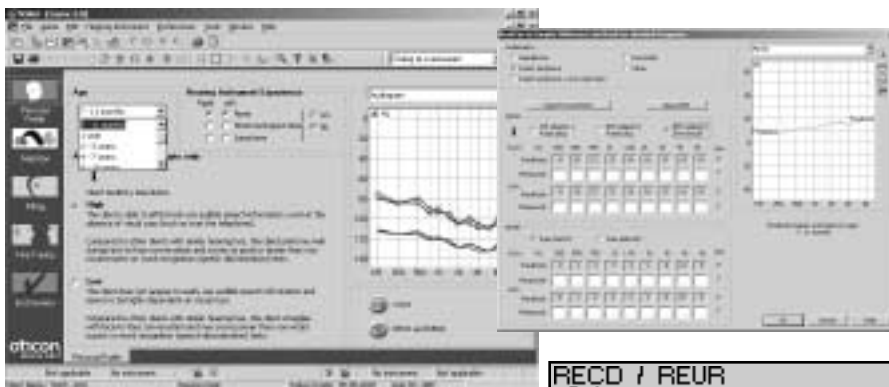


- 9 **FBM** (icon/button) gives access to the FBM tool for manual evaluation of the feedback margin. This allows the fitter to adjust the Feedback Manager to a different maximum VC level than prescribed. Using this tool, the volume setting of the instrument is gradually increased via the programming software, and the fitter then clicks 'Feedback present' as needed, to determine the actual FB margin. The FBM then limits any additional HF gain should the user turn the VC up above the new setting. The use of the manual FBM can provide additional HF gain in situations where the earmold fit is especially good, or if the HF cut (in A-Gram slope) has been adjusted to accommodate a user's sound quality preference.
- 10 **Telecoil Switch Options** allow the M-MT-T function switch to be set in various combinations.
- 11 **Beep Level.** An audible beep signal is activated when the user switches between the different modes. The setting can be varied to 7 different intensities or turned OFF. The default setting is 70 (dB SPL input).
- 12 **Beep Tone** sets the beep frequency to either 500 or 1000 Hz. Default frequency is 500 Hz.
- 13 **Test** makes it possible to evaluate the audibility of the beep signal during the fitting.
- 14 **Telecoil Boost** gives a +6 dB boost to the telecoil setting relative to the microphone gain setting.

The display in EasyFit gives access to the same fitting tools as with Genie, including the Feedback Manager and Telecoil options.

## Fitting infants and children

Infants and young children have smaller ear canals with different acoustic properties than the average adult. These differences are extremely important to take into account, especially when fitting powerful hearing instruments as there may be risk of impairing the remaining hearing of the user. Genie and EasyFit support age and audiometry information as explained below.



With Genie, the age parameters are found in Personal Profile. Select the relevant age and open the RECD and REUR dialog to enter Audiometry method and - if available - individual measurements. Default Audiometry is Headphones.

### Audiometry method

The acoustics of standard measurement couplers are not representative for the small ears of infants and children. Since hearing instrument and audiometer calibrations are performed with these couplers, corrections are needed for small ears. The Audiometry field in Genie and EasyFit gives access to specify the transducer that was used for the audiogram. The field has no impact on persons older than 7 years. Choices are:

- Headphone: default
- Free Field: use of a loudspeaker in free field
- Insert earphone: use of standard insert earphones
- Insert earphone + own mould: use of insert earphones and the child's own earmolds

Genie and EasyFit correct the audiometric data according to the selected Audiometry option.

### Real Ear to Coupler Difference (RECD)

Hearing instruments and earmolds block the ear canal, creating a closed space between the earmold and eardrum. In a child's ear canal, the space has a smaller volume than in the adult canal, resulting in greater sound pressure at the eardrum.

The relative size of the ear canal can be expressed by the use of RECD, which is the difference between the output measured in the ear and in the 2cc coupler, given the same HA setting. RECD is found by measuring the dB SPL in the child's ear - preferably using the child's own earmold - and subtracting the measured dB SPL in a 2cc coupler.

Genie uses either predicted RECD values or individual measured values in the prescription algorithm. EasyFit uses predicted RECD values only. The predicted values depend on the selected age category and, to some degree, on the fitting rationale chosen. In Genie, the age category is selected from the Personal Profile step. With EasyFit, it is found in the RECD dialogue.

With EasyFit, the age and RECD parameters are found in Aud view. Individual measurements cannot be entered. EasyFit uses the prediction method only.

### Real Ear Unaided Response (REUR)

The ear canal resonance of adults is around 3 kHz. It is the length of the ear canal that determines the resonance frequency. Compared with adults, the ear canals of children are shorter, thus the resonance frequency is higher. The REUR for a child may therefore be very different from an adult REUR.

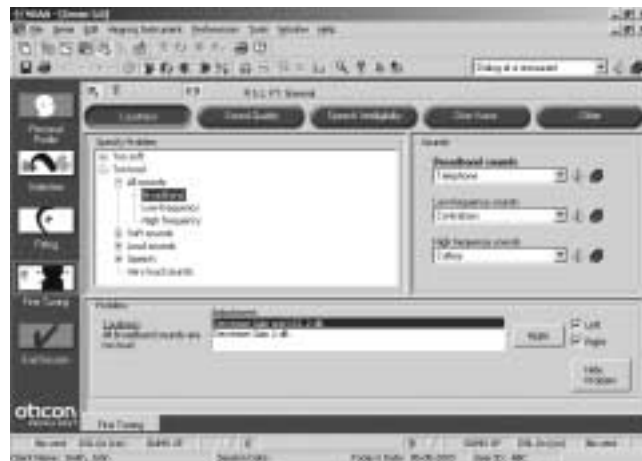
Genie and EasyFit use predicted REUR values. The predicted values depend on the age category selected. In Genie you may also enter the individually measured values.

### Fine Tuning

Both Genie and EasyFit provide help when fine tuning. In Genie, fine tuning is integrated in the fitting flow via the Fine Tuning step (see graphic below).

When a problem is identified, relevant groups of sounds and pictures will automatically be accessible. This will facilitate the dialogue with the client when specifying the problem further. The areas that are covered is Loudness, Sound Quality, Speech Intelligibility, Own Voice, Other (i.e. feedback problems) and Telecoil.

EasyFit has a Quick Guide document that will suggest solutions for the specified problems. Using either of the tools will make it easy to involve the client in the fine tuning process. If the client has filled in the Diary, it may be easier to identify and solve possible problems.



Genie supports fine tuning in the fitting flow. Verification of problems and solutions may be done through an interactive dialogue and with sound demos.

**Sound hooks**

SUMO XP comes standard with an un-damped sound hook ensuring high gain and output in the mid frequencies. A smoother response may be obtained by using the 5 dB damped hook. Damped hooks tend to collect more moisture than ordinary hooks and may become clogged. It is recommended that they are replaced twice yearly.

Hook size	Un-damped	5 dB damped
Standard	571-01-770-04	571-05-290-02



Paediatric	571-01-780-06	571-05-270-08
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**Spectacles adaptor**

SUMO XP may be adapted to most spectacles by using a special adaptor.

	Un-damped	5 dB damped
	571-04-170-04	571-04-180-06



**Earmold information**

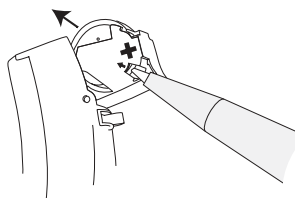
When fitting super power instruments, the importance of a tight fitting earmold cannot be over-emphasized. Oticon recommends the use of non-shrinking, stable impression materials such as A-Soft or A-Zilicone.

Material	40 impressions	75 impressions
A-Soft	782-50-121-08	782-50-120-07
A-Zilicone	782-50-054-07	782-50-055-08

Use of thick-walled tubing put through the earmold is recommended for the tightest possible fitting. Venting is not recommended for hearing losses above 70 dB HL.

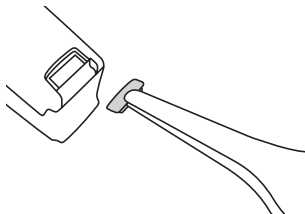
**Tamper-resistant battery drawer**

The tamper-resistant battery drawer is strongly recommended when fitting children or persons of mental incapacity. Available in beige, hair tone and kids colors. (Please refer to the yellow section in the Instructions for Use).



**Right and Left identification**

SUMO XP comes standard with a red and a blue plate for easy identification of right and left instruments. The pre-mounted grey plate can be replaced using a pair of tweezers as shown below:



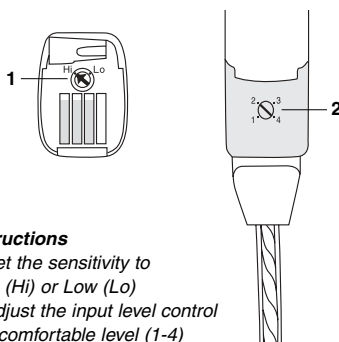
**Universal DAI shoe**

The universal DAI shoe for SUMO XP provides access to a variety of external sound sources such as:

- Radio, TV, Walkman, MP3 and PC equipment (**Hi** setting)
- Ear level FM system and body worn FM equipment (**Lo** setting)

The one shoe can be used for all DAI purposes.

DAI shoe 399-50-900-08



**Instructions**

- 1 Set the sensitivity to High (Hi) or Low (Lo)
- 2 Adjust the input level control to a comfortable level (1-4)

**DAI cords**

To connect audio equipment to DAI / hearing instrument, use one of the following cords:

Connection	Cord	Length	Oticon No.
	Monaural	75 cm	383-58-842-00
	Binaural (stereo)	75 cm	383-58-852-03
	Open end, monaural	100 cm	383-08-003-00
		600 cm	383-08-004-01

**FM adaptor shoe**

The FM adaptor shoe is used with ear level FM systems.

FM adaptor shoe 399-50-920-02

