



Science **made** smarter

Technical Specifications

Callisto™



Interacoustics



Included and optional parts

AC440	REM440	HIT440
<p>Standard parts</p> <ul style="list-style-type: none"> • DD45¹ audiometric headset • MTH400m monitor headset • B71 bone conductor¹ • APS3 patient response button¹ • Callisto™ Suite software • Callisto™ carrying bag • Standard USB cable <p>Optional parts</p> <ul style="list-style-type: none"> • TDH39¹ audiometric headset • DD65 v2¹ • DD450 high frequency headset¹ • IP30 insert earphones¹ • B71 bone conductor¹ • B81 bone conductor¹ • EMS400 talk back microphone • SP70 loudspeaker + wire • SP85A loudspeaker • SP90A loudspeaker • OtoAccess® Database • Accessory bracket • Travel trolley 	<p>Standard parts</p> <ul style="list-style-type: none"> • IHM60 In-situ headset (kit)^{1/2} • Probe tubes 36 pcs¹ • SP70 loudspeaker + wire • Callisto™ Suite software • Callisto™ carrying bag • Standard USB cable <p>Optional parts</p> <ul style="list-style-type: none"> • Extra edifier loudspeaker + wire • Callisto™ coupler base kit which includes: • Coupler base • Coupler box <ul style="list-style-type: none"> ○ 2cc coupler ○ ½" microphone ○ Reference mic. ○ ITE adaptor ○ BTE adapter ○ Body HA adaptor ○ BTE tubing • SPL60 In-situ probe tip-set + coupler adaptor¹ • Aidapters • Coupler seal wax • OtoAccess® Database • Accessory bracket • Travel trolley 	<p>Standard parts:</p> <ul style="list-style-type: none"> • TBS10 test box • Coupler box <ul style="list-style-type: none"> ○ 2cc coupler ○ ½" microphone ○ Reference mic. ○ ITE adaptor ○ BTE adapter ○ Body HA adaptor ○ BTE tubing • Aidapters • Coupler seal wax <p>Optional parts:</p> <ul style="list-style-type: none"> • Couplers 1.2CC and 0.6CC: ITE, BTE, ear simulator • Calibration adaptor • OtoAccess® Database • Travel trolley

1) Applied part as according to IEC60601-1

2) This part is not certified according to IEC 60601-1



General technical specifications

Callisto™ hardware - technical specifications

Medical CE-mark:	The CE-mark in combination with MD symbol indicates that Interacoustics A/S meets the requirements of the Medical Device Regulation (EU) 2017/745 Annex I Approval of the quality system is made by TÜV – identification no. 0123.	
Safety standards:	IEC 60601-1 2005 + CORR. 1 2006 + CORR. 2 2007 + A1 2012 ANSI/AAMI ES60601-1 2005 + A2 2010 2 A1 2012 CAN/CSA-C22.2 No. 60601-1:14 USB powered, Applied parts type B	
EMC standards	IEC 60601-1-2 2014 (4. ed.)	
Calibration	Technical information is located in the specifications for the software modules. Calibration information and instructions are located in the Service manual.	
PC requirements (recommended minimum)	2 GHz Intel i3 processor 4GB Ram 2.5 GB available disk space 1024x768 resolution (1280x1024 or higher recommended) Hardware accelerated DirectX/Direct3D graphics card. One or more USB ports, version 1.1 or higher.	
Operating Systems	Windows® 10 Professional (64 bit) Windows®11 Professional (64 bit)	
Compatible software	Noah 4, OtoAccess® and XML compatible.	
Input specifications	Talk back	240uVrms at max. input gain for 0dB VU reading 33KOhm input impedance
	Coupler (Test box)	Max input level before clipping 2.5Vrms Calibration relative to reference microphone Input impedance 100Kohm
	Reference (Test box)	Max input level before clipping 160mVrms Calibration at 94dB SPL 250Hz Input impedance 100KOhm
	Talk forward	240uVrms at max. input gain for 0dB VU reading 100KOhm input impedance
	Patient response	3.3V logic – 300 Ohm max. 11mA switch current
	Insitu R/L ref.	Max input level before clipping 160mVrms Calibration at 94dB SPL 250Hz Input impedance 100KOhm
	Insitu R/L tube.	Max input level before clipping 2.5Vrms Calibration relative to reference microphone Input impedance 100Kohm
	Wave files	PC (N/A)
	Right	Up to 3Vrms at min. 10 Ohm load 100Hz – 16KHz (-3dB)
	Left	Up to 3Vrms at min. 10 Ohm load 100Hz – 16KHz (-3dB)
Output specifications	Bone	Up to 5Vrms or 300mArms 5Ohm -300Ohm 100Hz – 8KHz (-3dB)
	FF power and line	Up to 3Vrms at min 8 Ohm load (1W max) 100Hz – 16KHz (-3dB)
	Monitor	Up to 1Vrms at 16 Ohm load 100Hz – 16KHz (-3dB)
	Insitu R/L	Up to 3Vrms at min. 25 Ohm load 100Hz – 16KHz (-3dB)



Data connections	USB-PC	USB B socket for connection to PC (compatible with USB 1.1 and later)
Dimensions (LxWxH)	21.2 x 12.1 x 4.4 cm / 8.3 x 4.8 x 1.7 inches	
Weight	0.6 kg / 1.2 lbs (With cradle: 0.8 kg / 1.8 lbs)	
Power supply	USB-powered with an internal “power boost” rechargeable battery and load balancer. Average: 300mA (Max: 500mA)	
Battery	NP120 3.7V 1700 mAH battery lithium ion 53x35.2x11. 3.2 to 4.2V	
Operation environment	Temperature:	10 – 35°C
	Re. Humidity:	15 – 90% Non-condensing
Transport and storage	Transport temperature:	-20 – 50°C
	Storage temperature:	0 – 50°C
	Re. Humidity:	10 – 95% Non-condensing



AC440 software - technical specifications

Medical CE-mark:	The CE-mark in combination with MD symbol indicates that Interacoustics A/S meets the requirements of the Medical Device Regulation (EU) 2017/745 Annex I Approval of the quality system is made by TÜV – identification no. 0123.	
Audiometer Standards:	Tone: IEC60645-1 2017/ANSI S3.6 2018 Type 1 EHF Speech: IEC60645-1 2017 /ANSI S3.6 2018 Type A or A-E	
Transducers & Calibration	Calibration information and instructions are located in the Service manual. Check the accompanying Appendix for RETSPL levels for transducers	
Air Conduction		
DD45	ISO 389-1 2017, ANSI S3.6-2018	Headband Static Force 4.5N ±0.5N
TDH39	ISO 389-1 2017, ANSI S3.6-2018	Headband Static Force 4.5N ±0.5N
DD65 v2	PTB 1.61-4091606/18, AAU 2018	Headband Static Force 11.5N±0.5N
HDA300	PTB report 1.61.4066893/13	Headband Static Force 8,8N ±0.5N
DD450	ISO 389-8 2004, ANSI S3.6-2018	Headband Static Force 10N ±0.5N
E.A.R Tone 3A/5A	ISO 389-2 1998, ANSI S3.6-2018	
IP30	ISO 389-2 1998, ANSI S3.6-2018	
CIR 33	ISO 389-2	
Bone Conduction	Placement: Mastoid	
B71	ISO 389-3 2016, ANSI S3.6-2018	Headband Static Force 5.4N ±0.5N
B81	ISO 389-3 2016, ANSI S3.6-2018	Headband Static Force 5.4N ±0.5N
Free Field	ISO 389-7 2005, ANSI S3.6-2018	
High Frequency	ISO 389-5 2004, ANSI S3.6-2018	
Effective masking	ISO 389-4 1994, ANSI S3.6-2018	
Patient response switch	Handheld push button.	
Patient communication	Talk Forward and Talk Back.	
Monitor	Output through external earphone or speaker.	
Stimuli	Pure tone, Warble tone, NB, SN, WN, TEN noise, Wave files.	
Tone	125-16000Hz separated in two ranges 125-8000Hz and 8000-16000Hz. Resolution 1/2-1/24 octave.	
Warble Tone	1-10 Hz sine +/- 5% modulation	
Wave file	44100Hz sampling, 16 bits, 2 channels	
Masking	Automatic selection of narrow band noise (or white noise) for tone presentation and speech noise for speech presentation.	
Narrow band noise:	IEC 60645-1:2001, 5/12 Octave filter with the same center frequency resolution as pure Tone.	
White noise:	80-16000Hz measured with constant bandwidth	
Speech Noise.	IEC 60645-1 2017 & ANSI S3.6 2018: 125-6000Hz falling 12dB/octave above 1KHz +/-5dB	
Presentation	Manual or Reverse. Single or multiple pulses. pulse time adjustable from 200ms-5000ms in 50mS steps. Simultaneous or alternating.	
Intensity	Check the accompanying Appendix for maximum output levels	
Steps	Available Intensity Steps is 1, 2 and 5dB	
Accuracy	Sound pressure levels: ± 2 dB Vibration force levels: ± 5 dB	
Extended range function	If not activated, the Air Conduction output will be limited to 20 dB below maximum output.	
Frequency	Range: 125Hz to 8kHz (Optional High Frequency: 8 kHz to 16 kHz) Accuracy: Better than ± 1 %	
Distortion (THD)	Sound pressure levels: below 1.5 % Vibration force levels: below 3 %.	



Signal Indicator (VU)	Time weighting: 350mS Dynamic range: -20dB to +3dB Rectifier characteristics: RMS Selectable inputs are provided with an attenuator by which the level can be adjusted to the indicator reference position(0dB)
Free field output level:	Compling INC60645-1 2017/ANSI S3.6 2018 at a distance of 1 meter from speaker
Storing capability	Tone audiogram: dB HL, MCL, UCL, Tinnitus, R+L Speech Audiogram: WR1, WR2, WR3, MCL, UCL, Aided, Unaided, Binaural.
Compatible software	Noah 4, OtoAccess® and XML compatible



REM software - technical specifications

Medical CE-mark:	The CE-mark in combination with MD symbol indicates that Interacoustics A/S meets the requirements of the Medical Device Regulation (EU) 2017/745 Annex I Approval of the quality system is made by TÜV – identification no. 0123.	
Real Ear Measurement standards	IEC 61669 2015, ANSI S3.46 2013	
Stimuli	Live voice Warble tone Pure tone Speech noise Random noise Pseudo Random noise Pink noise Chirp White noise band limited ICRA	Real speech ISTS Narrow band noise /SS/ /SH/ IFFM IF noise Real life sounds Custom sound files (automatic calibration available)
Frequency range	100Hz – 10kHz	
Frequency accuracy	< ± 1 %	
Distortion	< 2%	
Intensity range	40 – 100 dB	
Intensity accuracy	< ± 1.5 %	
Measurement Intensity Range	Probe microphone: 40-140 dB SPL ± 2 dB Reference microphone: 40 – 100 dB ± 2 dB	
Frequency Resolution:	1/3, 1/6, 1/12, 1/24 octave or 1024-point FFT.	
Cross talk	Cross talk in the probe and probe tube will alter the obtained results with less than 1 dB at all frequencies.	
Narrow band noise	5/12 Octave filtered	
Available tests:	REUR REIG RECD REAR REAG REOR	REOG REUG Input/output FM Transparency Directionality Visible speech mapping
Compatible Software:	Noah 4, OtoAccess® and XML compatible	



HIT440 software - technical specifications

Medical CE-mark	The CE-mark in combination with MD symbol indicates that Interacoustics A/S meets the requirements of the Medical Device Regulation (EU) 2017/745 Annex I Approval of the quality system is made by TÜV – identification no. 0123.	
Hearing Aid Analyzer Standards	IEC 60118-0 2015, IEC 60118-7 2005, ANSI S3.22 2014	
Frequency Range	100-10000Hz.	
Frequency Resolution	1/3, 1/6, 1/12 and 1/24 octave or 1024-point FFT.	
Frequency Accuracy	< ± 1 %	
Stimuli	Warble tone Pure tone Narrow band noise Random noise Pseudo random noise Pink noise White noise band limited Speech noise Chirp	ISTS ICRA Real speech IFFM IF Noise /SS/ /SH/ Custom sound files (automatic calibration available)
Sweep Speed	1,5 – 80 sec.	
FFT	Resolution 1024-points. Averaging: 10 – 500.	
Stimuli intensity range	40-100 dB SPL in 1 dB step.	
Intensity accuracy	< ± 1.5 dB	
Measurement Intensity Range:	Probe microphone 40-145 dB SPL ± 2 dB.	
Stimulus Distortion:	< 1 % THD.	
Available tests:	Additional tests can be designed by user	
	OSPL90 Full On Gain Input/output Attack/Recovery Time Reference Test Gain Frequency Response Equivalent Input Noise	Harmonic Distortion Intermodulation Distortion Microphone Directionality
Pre-Programmed Protocols:	HIT440 software comes with a set of Test Protocols loaded. Additional Test Protocols can be designed by user, or easily imported into the system.	
Compatible Software:	Noah 4, OtoAccess® and XML compatible	