



# Cello

## PC-BASED DIAGNOSTIC AUDIOMETER

### DESCRIPTION

Cello is a computer-controlled diagnostic audiometer, capable of performing fast and accurate air, bone and speech audiometry exams, as well as several additional tests including QuickSIN™, HF audiometry, and VRA using as reinforces either traditional cabinet toys or videos and images on one or more displays.

### CLASSIFICATION

IEC 60645-1: Type 2 Class A/AE  
 ANSI S3.6: Type 2A/2AE  
 IEC 60645-1 / ANSI S3.6: EHF (Extended High Frequency) Compliant (with HF option)

### AVAILABLE SIGNALS

Stimulus: pure tone, warble tone  
 2 external inputs and USB audio for speech audiometry  
 MIC input for live speech audiometry  
 Masking: NBN, WN, SN

### SIGNALS SPECIFICATION

Attenuator step: 1, 2 and 5 dB  
 Presentation: Continuous, Pulsed (0.5, 1 and 2 Hz)  
 Warble: 5 Hz sin wave modulating signal

### AVAILABLE OUTPUTS AND TRANSDUCERS

AC: Headphones (TDH-39 / DD45)  
 HF headphones (HDA-300 / DD450)  
 Insert earphones (ER-3 / IP30)  
 BC: B-71 bone vibrator  
 Free field  
 Insert masking earphone: IME-100

### AVAILABLE TESTS

- Pure Tone audiometry (HL and UCL)
- Auto threshold (modified Hughson-Westlake)
- HF audiometry (optional): from 8 to 20 kHz (18 and 20 kHz not displayed in the audiogram)
- Speech audiometry (SRT, WRS, MCL, and UCL)
- SISI
- Stenger, with pure tone or speech stimulation
- 2 independent channels Master Hearing Aid
- QuickSIN® test (optional)
- Visual Reinforcement Audiometry (VRA) and Conditioned Play Audiometry (CPA) test (optional) with video or toys reinforces

### PURE TONE: FREQUENCIES AND MAXIMUM LEVELS (dB HL)

Freq. (Hz)	AC	AC DD450	AC HDA-300 **	AC ER-3 IP30	AC ER-5 **	BC	FF*
125	80	85	85	90	90	-	75
250	100	100	100	105	100	45	85
500	110	110	120	110	110	65	95
750	115	110	120	115	120	70	95
1.000	120	110	120	120	120	75	95
1.500	120	110	110	120	120	80	95
2.000	120	110	110	120	115	80	95

3.000	120	110	110	120	115	75	95
4.000	120	105	110	110	110	75	95
6.000	105	100	100	100	100	55	90
8.000	95	90	100	90	90	50	85
9.000	-	90	90	-	-	-	80
10.000	-	90	90	-	-	-	80
11.200	-	90	90	-	-	-	80
12.500	-	80	80	-	-	-	80
14.000	-	70	70	-	-	-	80
16.000	-	50	60	-	-	-	50
18.000	-	110 dB SPL	100 dB SPL	-	-	-	-
20.000	-	110 dB SPL	90 dB SPL	-	-	-	-

[\*] The values refer to "normal" range; add 10 dB to each value in case of "extended range" option selected

[\*\*] No more available for purchasing but supported

### SPEECH AUDIOMETRY: MAXIMUM LEVELS (dB HL)

AC*	AC DD450	AC HDA-300 **	AC ER-3 IP30	AC ER-5 **	BC	FF
100	90	100	100	100	60	Normal: 75 Extended: 85

[\*] Reduce by 20dB in case of free field equivalent filter activation.

[\*\*] No more available for purchasing but supported

### PATIENT - OPERATOR COMMUNICATION

Talk over: external microphone (included)  
 Talk back: clip-on patient microphone (included), monitor headset to listen to the patient (included)  
 Patient response trigger

### MONITOR SIGNAL

Both channels monitored through the monitor headset (included)

### ASSISTANT MONITOR

Used for the operator to assistant communication (optional).

### CALIBRATION

Validity: 12 months  
 Separated calibration tables for each type of transducer (AC, AC-INS, AC-HF, INS-MASK, BC, FF)  
 All the parameters stored in the device through a dedicated software

### COMPUTER INTERFACE

Connection: USB (driverless)  
 Compatible software: Inventis Maestro  
 Minimum requirements: refer to Maestro software specifications

### POWER SUPPLY

External medical grade power supply.  
 AC consumption: 100-240Vac 50-60Hz 0.9-0.34A  
 DC output: 6V, 2A cont.



### MECHANICS

Size (WxDxH): 30.8 x 21.7 x 6.7 cm / 12.1 x 8.5 x 2.5 in  
Weight: 1.3 kg / 2.9 lbs

### APPLICABLE STANDARDS

Pure tone audiometry: IEC 60645-1, ANSI S3.6  
Speech audiometry: IEC 60645-1, ANSI S3.6  
High Frequency audiometry: IEC 60645-1, ANSI S3.6  
Calibration: ISO 389-1, ISO 389-2, ISO 389-3, ISO 389-5, ISO 389-7  
Electrical safety: IEC 60601-1, Class I type BF  
EMC: IEC 60601-1-2

### CE CERTIFICATE

MDR 2017/745/EU Classification: Class IIa  
Classification rule (Annex VIII, 2017/745): 10  
Notified body: TÜV SÜD Product Service GmbH (0123)

### PRODUCT CODES

10558: Cello – Computer controlled diagnostic audiometer

### INCLUDED PARTS

- DD45 or TDH-39 supra-aural headphones
- B71 bone vibrator
- Patient response switch
- Monitor headset with boom microphone
- Clip-on microphone for patient-to-operator communication
- Medical grade power supply
- USB connection cable
- User manual
- Inventis Software Suite

### OPTIONAL PARTS (with order code)

- 10833: ER-3C insert earphones
- 11748: IP30 insert earphones
- 10177: IME-100 insert masking earphone
- 10179: Amplivox Audiocups noise excluding enclosures for TDH-39 and DD45 headphones
- 10181: Desktop microphone for live speech tests
- 10180: Cable set for sound booths with jack sockets
- 10557: Cable set for sound booths with RCA sockets
- 10266: One active speaker FBT J 5A (230V model)
- 10544: One active speaker FBT J 5A (120V model)
- 11061: Soft carrying case
- 10253: Additional patient response switch

Only for Cello with VRA extension:

- 10302: Visual Reinforcement for pediatric audiometry – Toy Type 1
- 10303: Visual Reinforcement for pediatric audiometry – Toy Type 2
- 10053: Dedicated table for Pediatric Audiometry systems
- 10307: Stand for toy and speaker
- 10308: Pre-configured mini-tower computer with 4 video outputs - includes the webcam

### OPTIONAL EXTENSION LICENSES AND PACKAGES

- 10560: High-Frequency extension package for Cello
- 10533: QuickSIN® test license
- 10562: Pediatric audiometry (VRA) extension package for Cello. Includes the license code, the desktop switch and the assistant monitor headphones.

Cello is developed by:

#### INVENTIS S.r.l.

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