



Description

HMS II.4 is ideally suited for all measurements in telecommunications under realistic conditions in receiving direction. In contrast to HMS II.3, HMS II.4 is equipped with an ear simulator only, not with an artificial mouth. HMS II.4 meets ITU-T P.58 regarding its geometrical dimensions. Diffraction and reflection at its shoulders and torso realistically reproduce the acoustic behavior of a listening person.



HMS II.4 setup with labCORE and wireless headphone

HMS II.4 is delivered with the anatomically shaped pinna simulator type 3.3 according to Recommendation ITU-T P.57. Type 3.3 is recommended when the anatomy of the human ear plays an important part, e.g. for intra-concha headsets or hearing aids. When desired, HMS II.4 can also be retrofitted with the simplified pinna simulator type 3.4 according to Recommendation ITU-T P.57. This pinna allows the use of different ear canals.

The right ear comes equipped with an IEC 60318-4 (2010-01)-compliant impedance simulator. For binaural measurements, the left ear can be equipped likewise. HMS II.4 can also be retrofitted with low-noise ear simulator(s) of HMS II.3-LN.

Recording

For measurements, HMS II.4 connects to the communication analysis system ACQUA via the hardware platform labCORE. In combination with the necessary hardware modules and the software option labBEQ, individual equalization of binaural acoustical signals is possible. This includes support for various equalization variants, e.g. as laid out in Recommendation ITU-T P.581.

DATA SHEET

HMS II.4-33 (Code 1240.1)

HEAD Measurement System with Ear Simulator

Overview

HMS II.4 is an Artificial Head Measurement System for measuring close-to-the-ear transducers in handsets, headsets, headphones, hearing protectors and hearing aids. By realistically replicating all acoustically relevant structures of the human anatomy, HMS II.4 also allows measurements of far-to-the-ear transducers such as hands-free equipment.

HMS II.4 is equipped with an impedance simulator in the right ear, meeting the requirements in the Recommendations ITU-T P.57 and P.58. If required, the left ear can be equipped likewise.

HMS II.4 is delivered with anatomically shaped pinnae type 3.3 and can be retrofitted with simplified pinnae type 3.4, both according to ITU-T P.57.

In contrast to HMS II.3, HMS II.4 is not equipped with an artificial mouth.

Key Features

- Geometric and acoustic characteristics according to ITU-T P.58
- Award-winning design
- Convenient mobile use in conjunction with portable hardware

Ear simulator:

- Ear simulator according to IEC 60318-4 (2010-01)
- Supports ITU-T P.57 pinnae types:
 - Anatomically shaped type 3.3
 - Simplified type 3.4
- Individual digital equalization via BEQ options
- High quality microphone with low inherent noise floor

Applications

- Measurement in receive direction of:
 - Telephone terminal equipment
 - Hands-free devices
- Measurement of arbitrary:
 - over-/on-/in-ear devices (headsets/headphones/earphones/in-ears)
 - active and passive hearing protection systems
 - hearing aids (e.g. intra-concha)

If available, the Binaural Equalizer BEQ II.1 can be used alternatively to *labCORE*.

In conjunction with the optional power box *labPWR* 1.2 for *labCORE*, mobile recording (e.g. in vehicles) is also possible with HMS II.4.

Accessories

For measurements of handsets with HMS II.4, the artificial head allows mounting of the optional Handset Positioner HHP IV or HHP III.1. HHP IV is fully motorized and thus remotely controllable as well as fully automatable via ACQUA. HHP III.1 only allows manual positioning of the handset. Both Handset Positioners allow precise positioning of any handset at various locations and definable application forces to the pinna, ensuring meaningful and repeatable measurement results.

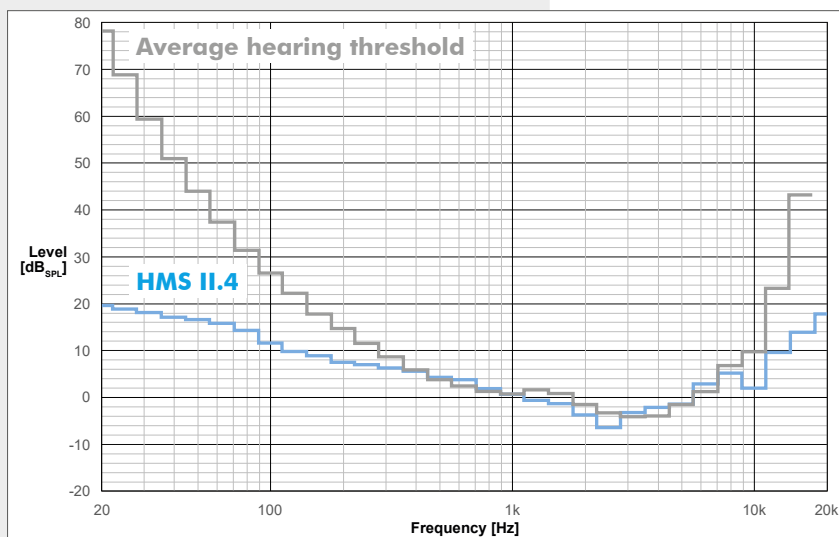
Another accessory for HMS II.4 is the artificial nose AN-HMS, enabling measurements of nose-supported devices, e.g. AR/VR glasses and headsets.

The supplied Torso Box HTB VI acoustically simulates a human torso. Its compact design allows easy handling and transportation of the complete system, e.g. for mobile applications.



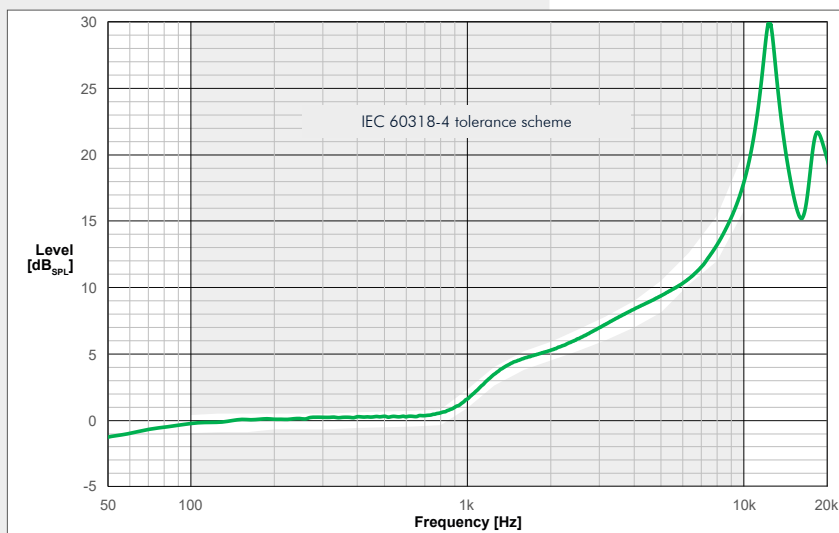
HMS II.4-33 on Torso Box HTB VI

Measurements - artificial ear



Self-noise of HMS II.4 ear simulator

- All curves are diffuse-field equalized
- HMS II.4 is measured with 4096 FFT
- Avg. hearing threshold acc. ISO 389-7



Typical transfer impedance of HMS II.4 ear simulator

- Curve and tolerance scheme standardized to 500 Hz

General Requirements

Hardware:

- **labCORE (Code 7700)**, Modular multi-channel hardware platform
 - **coreBUS (Code 7710)**, I/O bus mainboard
 - **coreIN-Mic4 (Code 7730)**, Microphone input board, for receiving direction
 - **coreBEQ (Code 7740)**, Binaural equalization

Software:

- **ACQUA (Code 6810)**, Basic analysis software, full-license version

Options

- **HIS L (Code 1231)**, Impedance simulator for left ear including microphone
- **HIS L/R-LN (Cd. 1231.3/1232.3)**, HEAD Impedance Simulator, Left/Right, Low-Noise Version, for HMS II.3/4/5
- **HEL/HER III.1 (Code 1248/1249)**, Simplified pinna type 3.4 (left/right) according to ITU-T P.57
- **HEL/HER IV.2 (Code 1381/1382)**, Anatomically shaped pinna type 3.3 (left/right) according to ITU-T P.57
- **ECS I.1-I.3 (Code 1357.2-1357.4)**, Ear canal simulation small/medium/large for Pinna type 3.4
- **HHP III.1 (Code 1403)**, Handset positioner for HMS II.3, VariMount version

Technical Data	
Artificial Ear (receiving direction)	
Transmission range	3 Hz – 20000 Hz
Dynamic range	> 110 dB _{SPL}
Dynamic range lower limit	23 dB _{SPL} (A)
Dynamic range upper limit	164 dB _{SPL}
Microphone sensitivity	12.5 mV / Pa
Polarization voltage	200 V
Supply voltage	HMS revision B01*: + 120 V (recommended), ± 60 V (possible) HMS revision C01*: ± 60 V (recommended), + 120 V (possible)
Frequency response	According to ITU-T P.58
Directivity characteristics	According to ITU-T P.58
Environmental conditions	
Operating temperature range	0°C – 50 °C, 32°F – 122°F
Storage temperature range	-20°C – 70°C, -4°F – 158°F
Humidity	20% – 80% relative humidity (non-condensing environment)
Dimensions	
Overall dimensions (W x H x D)	450 x 400 x 180 mm
Weight	Approx. 5.4 kg

- **HHP IV (Code 1406)**, Handset positioner for HMS II.3, MotoMount (Hexapod) version
- **AN HMS (Code 1418)**, Extension for HEAD measurement system HMS: Artificial nose
- **HWS (Code 1960)**, Windshield for outdoor recording
- **HMT III (Code 1961)**, Height-adjustable tripod for HMS
- **HSC IV-V4 (Code 1524-V4)**, Carrying case for HMS II.x
- **TLP (Code 1967)**, Triaxial laser pointer for HMS/HSU positioning incl. two batteries and carrying case
- **HCC-HMS (Code 1641)**, Carrying case for accessory parts HMS II.x, contains:
 - Calibration adapter
 - 2.5 mm Allen key
 - Ear canal key
- **Manual**

Delivery items

- **HMS II.4-33 (Code 1240.1)**, HEAD Measurement System, with 3.3 Pinna and Right Ear Simulator (w/o Artificial Mouth)
- **HIS R (Code 1232)**, HEAD impedance simulator, right, for HMS II.3/4/5
- **HEL/HER IV.2 (Code 1381/1382)**, ITU-T type 3.3 flexible pinna for HMS II.x left/right ear, 35 shore OO hardness
- **HTB VI (Code 1574)**, HEAD torso box for HMS II/III/IV & HSU
- **CSB II (Code 9849)**, Adapter Speakon male <-> Banana plug

* The revision is stated on the type label at the back or the bottom of each HMS system.