



Description

HMS II.5 is ideally suited for all measurements in sending direction in the field of telecommunications under realistic conditions. HMS II.5 is delivered with the same artificial two-way mouth as HMS II.3, but without ear simulators. As numerous telecommunication measurement scenarios require a second talker, HMS II.5 is the ideal complement to an existing HMS II.3 in a multi-talk scenario. If measurements in receiving direction with HMS II.5 are desired, it can be retrofitted with one or both ear simulators of HMS II.3 as well as the low-noise ear simulators of HMS II.3-LN. Also, the delivered anatomically shaped pinnae type 3.3 can be replaced with the optionally available pinnae type 3.4.

The artificial mouth of HMS II.5 is compliant with ITU-T P.58 in its free-field characteristics, including diffraction and reflection at the shoulders and torso. Thus, it realistically reproduces the acoustic behavior of a test person. HMS II.5 also meets ITU-T P.58 regarding its geometrical dimensions. Its diffraction and reflection characteristics are comparable to those of a listening person.

Playback

For measurements, HMS II.5 connects to the communication analysis system ACQUA via the hardware platform labCORE. The artificial mouth of HMS II.5 is powered by labCORE's optional

coreOUT-Amp2 module. ACQUA allows comfortable and precise equalization of the mouth. The two-way design of the mouth provides an excellent unequalized frequency response and a wide frequency range, making it ideally suited for super-wideband and fullband measurements.

In conjunction with the optional power box labPWR 1.2 for labCORE, mobile playback (e.g. in vehicles) is also possible with HMS II.5.

Accessories

When retrofitted with ear simulators, HMS II.5 can be used with the optional handset positioners 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 allows manual positioning of the handset. Both allow precise positioning of any handset as well as precise adjustment of application forces to the pinna, ensuring meaningful and repeatable measurement results.

Another accessory for HMS II.5 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.

DATA SHEET

HMS II.5 (Code 1388)

HEAD Measurement System with Artificial Mouth

Overview

HMS II.5 is an Artificial Head Measurement System for testing and measuring communication devices in sending direction. By realistically replicating all acoustically relevant structures of the human anatomy, HMS II.5 also allows measurements of far-to-the-ear transducers such as hands-free equipment.

HMS II.5 is equipped with an artificial mouth meeting the requirements in the Recommendation ITU-T P.58. The mouth reproduces the complete spectrum of human voice, allowing super-wideband as well as fullband measurements in sending direction.

HMS II.5 is delivered with anatomically shaped pinnae type 3.3 without impedance simulators. It can be retrofitted with impedance simulators of HMS II.3 or HMS II.3-LN (low-noise) as well as with simplified pinnae type 3.4.

Key Features

- Geometric and acoustic characteristics according to ITU-T P.58
- Award-winning design
- Convenient mobile use in conjunction with portable hardware
- Can be retrofitted with ear simulator(s) for measurements in receiving direction

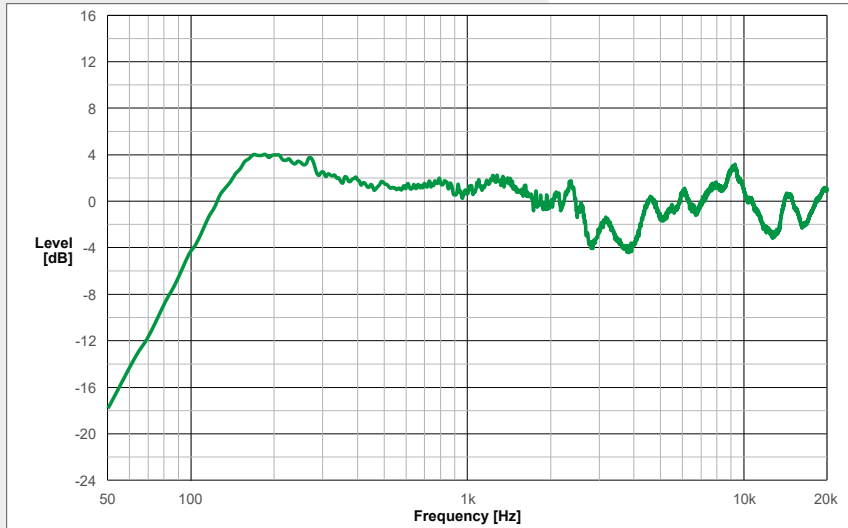
Artificial mouth:

- Low-distortion two-way design with wide frequency range for SWB/FB measurements
- Radiation characteristics according to ITU-T P.58
- Supports digital equalization in ACQUA

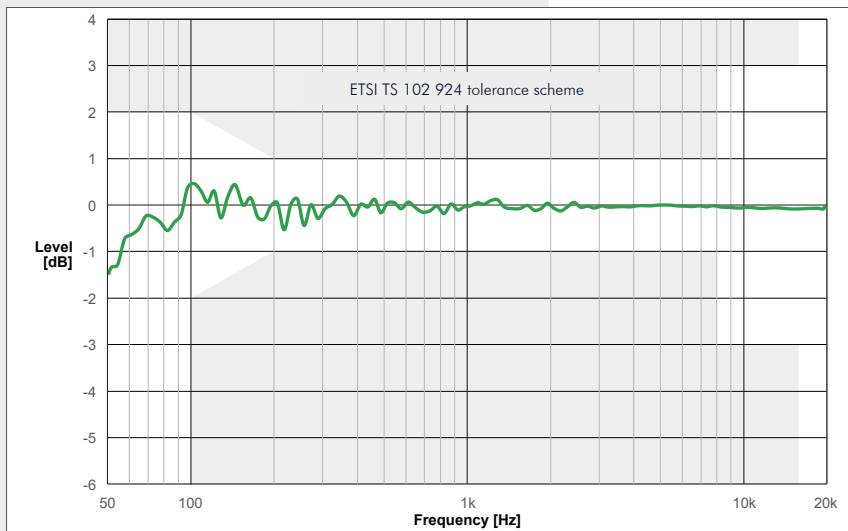
Applications

- Measurement in sending direction of:
 - Telephone terminal equipment
 - Hands-free devices
 - Voice-controlled devices (e.g. smart speakers)

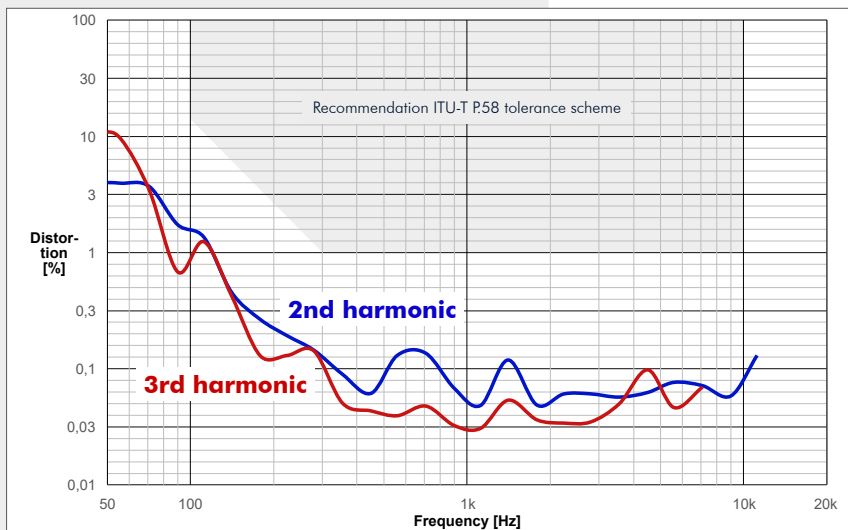
Measurements - artificial mouth



Typical unequalized frequency response of two-way mouth



Typical frequency response of equalized two-way mouth



Harmonic distortion of equalized two-way mouth at 0 dB_{P0}

General Requirements

Hardware:

- **labCORE (Code 7700)**, Modular multi-channel hardware platform
 - **coreBUS (Code 7710)**, I/O bus mainboard
 - **coreOUT-Amp2 (Code 7720)**, Power amplifier board, for sending direction

Software:

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

Options

- **HIS L/R (Code 1231/1232)**, Impedance simulator for left ear including microphone
- **HIS L-LN/R-LN (Code 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 cylindrical /small /medium /large (for pinna type 3.4)
- **HHP III.1 (Code 1403)**, Handset positioner for HMS II.3, VariMount version
- **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)**, HEAD wind-screen for outdoor recordings, for use with HMM, HMS & HRS
- **HMT III (Code 1961)**, Height-adjustable tripod for HEAD measurement system 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

Delivery items

- **HMS II.5 (Code 1388)**, HEAD measurement system, with 3.3 pinna and artificial mouth (w/o ear simulators)
- **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



Exemplary application: HMS II.3 (on the left), HMS II.5 (on the right) and a smart speaker on HRT-I in a multi-talk test scenario

- **HTB VI (Code 1574)**, HEAD torso box for HMS II/III/IV & HSU
- **CSB II (Code 9849)**, Adapter Speaker male <-> Banana plug
- **HCC-HMS (Code 1641)**, Carrying case for accessory parts HMS II.x, contains:
 - Microphone holder with 1/2" clip-on adapter
 - MRP pointer
 - Lip ring
- **Manual**

Technical Data	
Artificial Mouth (sending direction)	
Loudspeaker configuration	2-way
Transmission range	Approx. 50 Hz – 20000 Hz
Power limit	Max. 20 W (sine) Max. 50 W (music) (max. power is electrically limited beyond 6 kHz)
Impedance	4 Ω
Frequency response (equalized)	Exceeds ETSI TS 102 924
Distortion factor	Exceeds 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