



Description

HMS II.6 is ideally suited for all measurements in the field of telecommunications under realistic conditions in free-field applications. It is equipped with two high-sensitivity free-field microphones attached to free-field pinnae. The pinnae are similar to the simplified pinna type 3.4 out of Recommendation ITU-T P.57 in their general shape. The free-field pinnae have solid earlobes as opposed to the flexible earlobes of type 3.4, thus not allowing handset measurements.

With geometrical dimensions meeting ITU-T P.58, HMS II.6 accurately replicates human hearing in any far-from-the-ear sound scenario. Thus, the system is ideally suited for measuring and recording hands-free devices used in vehicles, offices, at home and other environments.

The artificial mouth of HMS II.6 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.

Playback and recording

For measurements, HMS II.6 connects to the communication analysis system ACQUA via the hardware platform *labCORE*. In combination with the necessary hardware modules including

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

The artificial mouth of HMS II.6 is powered by the *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 recording and playback (e.g. in vehicles) are also possible with HMS II.6.

Torso Box HTB VI

The Torso Box HTB VI delivered with HMS II.6 acoustically emulates a human torso. Mounting HMS onto the torso box is quick and convenient with a tool-less Camlock fastener, opening the torso box is tool-less as well. The side-mounted handles of HTB VI allow easy transportation of the complete system, e.g. for mobile applications.

DATA SHEET

HMS II.6 (Code 1389)

HEAD Measurement System, with Artificial Mouth and Free-Field Microphones (Left & Right)

Overview

HMS II.6 is an Artificial Head Measurement System with binaural free-field microphones and a full-band-capable artificial mouth. It is ideally suited for testing and measuring communication devices in far-from-the-ear scenarios.

The free-field microphones include free-field pinnae. The artificial mouth of HMS II.6 meets the requirements of 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.6 is ideally suited for binaural measurements of far-from-the-ear equipment (e.g. hands-free devices) in sending and receiving direction.

Key Features

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

Free-field ears:

- Binaural free-field microphones with high sensitivity
- Individual digital equalization via BEQ options
- High quality microphones with low inherent noise floor

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

- Free-field measurements in send/receive direction of:
 - In-car hands-free and infotainment systems
 - In-car eCall systems
 - Smart speakers
 - Conferencing systems & devices

General Requirements

Hardware

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

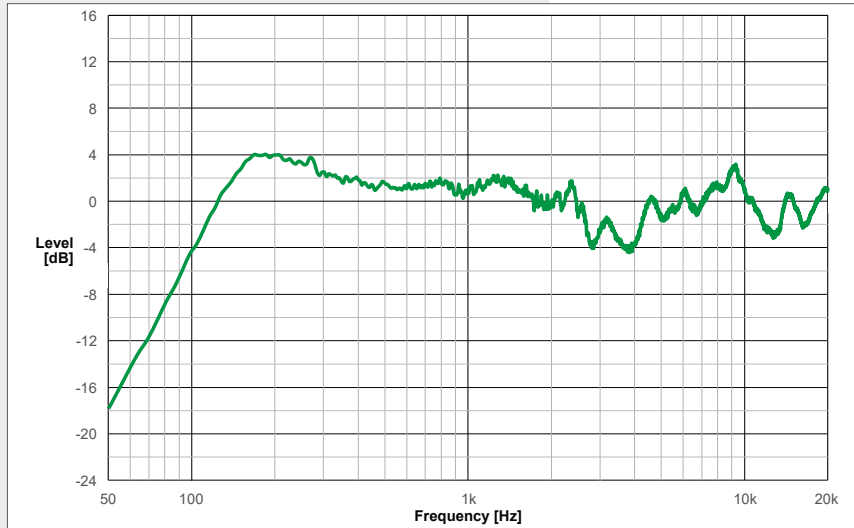
Options

- **HWS (Code 1960)**, Windshield for outdoor recording
- **HMT III (Code 1961)**, Height-adjustable tripod for HMS
- **HSC IV (Code 1524)**, HMS carrying case
- **TLP (Code 1967)**, Triaxial laser pointer for HMS/HSU positioning incl. two batteries and carrying case

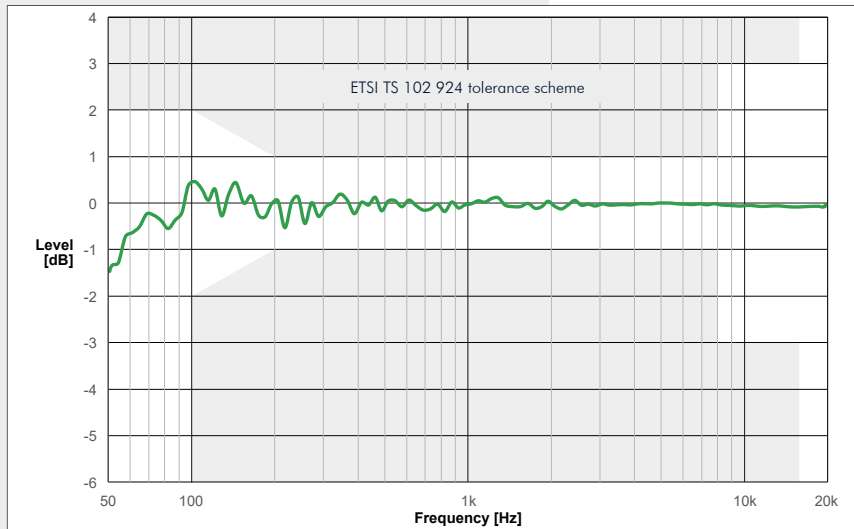
Delivery items

- **HMS II.6 (Code 1389)**, HEAD Measurement System, with Artificial Mouth and Free-Field Microphones (Left & Right)
- **HTB VI (Code 1574)**, HEAD torso box for portable artificial head measurements
- **CSB II (Code 9849)**, Adapter Speakon Male <-> Banana plug
- **Accessories case 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
 - 2.5 mm Allen key
- **Manual**

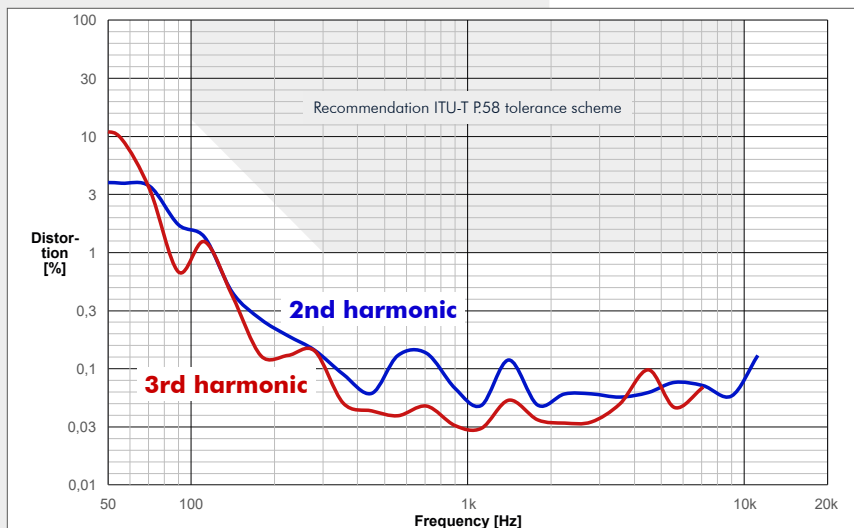
Measurements - artificial mouth



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}

| Technical Data | |
|---|--|
| Artificial Ear (receiving direction) | |
| Transmission range | 3.5 Hz – 20000 Hz |
| Dynamic range lower limit | 15 dB _{SPL} (A) |
| Dynamic range upper limit | 145 dB _{SPL} |
| Microphone sensitivity | 50 mV / Pa |
| Polarization voltage | 200 V |
| Supply voltage | + 120 V (recommended), ± 60 V (possible) |
| Frequency response | According to ITU-T P.58 |
| Directivity characteristics | According to ITU-T P.58 |
| 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 |



HMS II.6 on torso box HTB VI in a typical in-car hands-free communication test scenario