

## It's all about UX

The complete audio experience  
test solution for the modern car

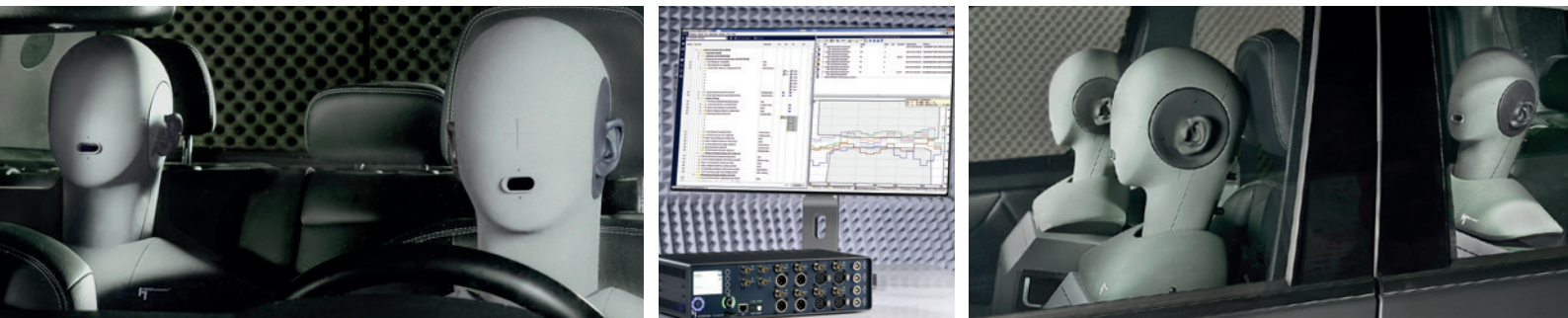
# Car Audio Testing

In-car communication, voice control, audio system, hands-free equipment, eCall: More and more applications in modern cars emerging, where voice quality and audio quality play a central role. These systems must fulfil the highest quality requirements to positively influence the experience in the vehicle cabin.

In order to measure, analyze, and optimize all voice and audio quality aspects of head units in the modern car, HEAD acoustics provides integrated test solutions to fully characterize objectively and perceptually the user's audio experience relative to any passenger's location within the cabin. For this purpose, powerful interfaces and test methods are available for evaluating single components as well as complete car audio systems via VoIP, VoLTE, Bluetooth®, USB, and WiFi.

Besides microphone and loudspeaker selection and placement e.g. the following parameters are relevant for car audio testing:

- Voice quality in receiving and sending direction
- Echo performance
- Noise reduction
- Double talk capability
- Speech intelligibility inside/outside the car
- Automatic gain and volume control
- Performance in the presence of background noise
- Bluetooth audio performance



## HEAD acoustics test solution comprises:

ACQUA software offers advanced analysis methods for all essential voice and audio quality parameters

*labCORE* as the modular multi-channel hardware platform providing all required interfaces

HMS II.3 is the artificial head measurement system, comprising ear simulator and artificial mouth, which is fully capable of super-wideband testing

3PASS *flex* for background noise simulation enables evaluating the performance under true-to-reality conditions

VoCAS is the turnkey solution for objective and fast quality assessment of voice control systems under realistic and reproducible test conditions

ACQUA test suites cover measurements according to essential standards such as ITU-T P.1100, P.1110, P.1120, P.1140, and GOST 33468-2015

Perceptual predictors such as

- 3QUEST-SWB/FB for evaluating voice quality in super-wideband/fullband scenarios in the presence of background noise
- Speech Intelligibility Index for determining how much noise impacts the intelligibility of speech
- Listening Effort assessment
- Audio MOS for multi-dimensional instrumental quality assessment of immersive audio systems
- EQUEST for assessing the echo performance
- POLQA for measuring voice quality in silence

HEAD acoustics Quality Standards such as HQS-ICC and HQS-Audio enable car manufacturers and developers to assess and optimize the performance of the built-in system

Want to learn more about HEAD acoustics solutions for car audio testing?  
Email to: [telecom@head-acoustics.com](mailto:telecom@head-acoustics.com)