

## **In-Car Communication: Measuring communication quality in vehicles with HEAD acoustics automated test suite**

### **Acoustic measurements according to international recommendation ITU-T P.1150**

In-car communication (ICC) systems help to improve communication in the vehicle between the occupants. To ensure a base level of functionality and quality of ICC systems, the international standardization body ITU-T has defined appropriate tests in Recommendation P.1150. HEAD acoustics has now implemented this recommendation as automated test sequences for the communication quality analysis software ACQUA, thus enabling comprehensive acoustic measurements of ICC systems and components in accordance with the international recommendation.

### **Measurements cover all relevant acoustic parameters**

In combination with additional HEAD acoustics measurement equipment, the measurements implemented in the test suite cover all relevant acoustic parameters of ICC systems. Manufacturers of systems or individual components can test and optimize the effects of listening effort, acoustic stability and the signal-to-noise ratio of their devices in accordance with the standard. In addition, measurements of double talk attenuation and the delay between the original voice and the voice transmitted by the ICC system are available. The test suite P.1150 supports vehicles with A<sup>2</sup>B<sup>®</sup> technology. In conjunction with the A<sup>2</sup>B<sup>®</sup> interface of HEAD acoustics hardware platform *labCORE*, users can easily record background noise via A<sup>2</sup>B<sup>®</sup> and insert it digitally via the bus to test the ICC system. The ACQUA test suite also employs a technique called "Time Domain Signal Subtraction". This method allows compensating background noise and/or unwanted speech signals in the time domain and is used to extract, for example, only the audio signals that are transmitted by the ICC system itself. In this way, users can, e.g. analyze the recorded speech without the interior noise of the vehicle.

### **Optimize the entire system as well as individual components**

"With our automated and standards-compliant solution, manufacturers can not only optimize positioning of hands-free microphones and loudspeakers, but also tune the interaction between hardware and software components," reports Christian Schüring, Sales Manager Telecom at HEAD acoustics GmbH. "This enables optimization of communication quality of the entire ICC system as well as individual components."

### **About HEAD acoustics**

HEAD acoustics GmbH is one of the world's leading companies for integrated acoustic solutions as well as sound and vibration analysis. In the telecom sector, the company enjoys global recognition due to the expertise and pioneering role in the development of hardware and software for the measurement, analysis and optimization of voice and audio quality as well as customer-specific solutions and services. HEAD acoustics' range of services covers sound engineering for technical products, investigation of environmental noise, speech quality engineering as well as consulting, training and support. The medium-sized company from Herzogenrath near Aachen has subsidiaries in China, France, Italy, Japan, South Korea, the UK and the USA as well as numerous sales partners worldwide.

## Images



P.1150 is the new test suite for the use with communication analysis software ACQUA. It enables automated and standard-compliant tests of ICC systems with the aim of optimizing communication quality.



The measurements implemented in the ACQUA test suite P.1150 consider aspects such as double talk attenuation, acoustic stability and listening effort.