



HEAD acoustics Enables End-to-End Validation of Next-Generation eCall Systems

Automotive Safety and Communications

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Keysight and HEAD acoustics Achieve Successful Interoperability Test for Next-Generation eCall Systems

01**Company**

HEAD acoustics, provider of automotive acoustic testing solutions for speech, audio, and communication quality

02**Solutions**

Keysight E6950B eCall Conformance Test Solution and UXM-based RF test platform with HEAD acoustics ACQUA and lab CORE

03**Challenge**

Validate NG eCall speech quality, network connectivity, and compliance readiness across new and legacy cellular technologies

04**Results**

Verified 4G / 5G IMS-SIP connection, end-to-end NG eCall audio, legacy 2G / 3G eCall audio, and delay and audio-level calibration

HEAD acoustics provides automotive acoustic testing expertise for speech, audio, and communication quality applications. As vehicles transition toward 5G-enabled emergency call systems, automakers and system suppliers need dependable ways to validate emergency communications across evolving network technologies.

Keysight and HEAD acoustics completed interoperability testing between Keysight's UXM-based Next Generation eCall solution and HEAD acoustics' acoustic test environment, including ACQUA and lab CORE. The work demonstrated end-to-end validation of NG eCall functionality across 4G and 5G networks and successful fallback verification over 2G and 3G networks.

“**Matthias Wegerhoff****Managing Director, HEAD acoustics**

The interoperability with Keysight technology brings valuable technical expertise to this mission, enabling us to jointly develop future-ready tools for next-generation voice and audio quality testing.

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The Challenge

Emergency call systems are a critical part of connected vehicle safety. As vehicles adopt 5G-enabled communication capabilities, automakers and suppliers must ensure that emergency calls remain reliable across changing network conditions and technology generations.

Next Generation eCall introduces new validation needs. Engineering teams must verify that in-vehicle emergency call systems can establish the required connection, transfer information, and support high-quality voice communication. They also need to test fallback operation over legacy networks so that emergency communication remains available when 4G or 5G service is not accessible.

The challenge is both technical and regulatory. Vehicle platforms are designed for global markets, and emergency call systems must align with evolving standards. The interoperability milestone was completed in anticipation of regulations including CEN EN 17240:2024 in the European Union and GB 45672-2025 in China, which will require standardized speech quality testing for in-vehicle emergency call systems by 2027.

For manufacturers and system suppliers, lab-based validation is essential. Testing must be repeatable, standards-oriented, and capable of covering both wireless network behavior and acoustic performance. Without an integrated approach, teams may need to manage separate RF and audio validation workflows, increasing complexity and slowing readiness for future NG eCall requirements.



The Solution

Keysight and HEAD acoustics connected Keysight's UXM-based NG eCall solution with HEAD acoustics' measurement environment, including ACQUA and lab CORE. The test was conducted at Keysight's Center of Excellence in Böblingen and verified seamless integration between the Keysight RF test platform and the HEAD acoustics acoustic test setup.

The **Keysight E6950B eCall Conformance Test Solution** supports validation of eCall, ERA-GLONASS, and NG eCall systems. In this collaboration, the solution enabled RF and network test capabilities that could be used with HEAD acoustics' acoustic measurement tools to evaluate emergency call performance across cellular technologies.

Together, the systems created a more complete validation environment for NG eCall. Keysight provided the network and RF test capability, while HEAD acoustics contributed the acoustic validation environment needed to assess voice and audio behavior. This combination addressed a core requirement for emergency call systems: communication must work at both the network layer and the human voice interaction layer.

The integrated setup supports comprehensive NG eCall testing across 4G and 5G networks, with legacy fallback testing over 2G and 3G. This gives automotive engineering teams a controlled way to verify emergency call functionality before deployment and to prepare for changing global regulatory expectations.



eCall / NG-eCall / Hybrid
eCall / China eCall Testing

Figure 1. The E6950B NG eCall solution

Results

The interoperability test verified 4G / 5G IMS-SIP server connection and end-to-end audio with NG eCall. It also successfully verified legacy eCall audio over 2G / 3G networks and calibrated delay and audio levels for compliance testing. These results show that the integrated Keysight and HEAD acoustics environment can support the end-to-end validation needs of next-generation emergency call systems.

The work gives automakers and system suppliers a practical path to test NG eCall performance across multiple network generations. That matters because vehicles must operate in varied coverage environments, and emergency call reliability cannot depend on a single cellular technology.

The milestone also supports preparation for global safety standards. As speech quality testing becomes a formal requirement for in-vehicle emergency call systems, engineering teams need tools that can validate RF connection behavior, audio performance, and timing characteristics in a repeatable lab environment.

By combining Keysight's RF test capabilities with HEAD acoustics' acoustic validation expertise, the collaboration supports a more integrated approach to connected vehicle safety testing. It helps reduce the gap between wireless connectivity validation and speech quality assessment, giving development teams a clearer path to NG eCall readiness.

Conclusion

Next-generation emergency call systems must work across new and legacy cellular technologies while providing reliable voice communication during critical events. Validating these systems requires both wireless network emulation and acoustic test expertise.

The interoperability work between Keysight and HEAD acoustics brings these capabilities together. The result is a lab-based validation approach that supports NG eCall functionality, fallback testing, delay calibration, and audio-level calibration for compliance-oriented automotive testing.

Related Information

- [Keysight E6950B eCall Conformance Test Solution](#)
- [HEAD acoustics website](#)
- [Keysight Automotive Communications Testing](#)
- [Keysight and HEAD acoustics Achieve Successful Interoperability Test for Next-Generation eCall Systems](#), November 12, 2025 press release



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