



The Future of Mobile Vehicle Testing: A New Era of Reliability and Innovation

From electrification to autonomous driving, next-generation RLDA solutions such as Fusion RX – supported by advanced software – are redefining durability testing for a smarter, safer world.

Why mobile vehicle testing is at a crossroads

For decades, mobile vehicle testing has been the unsung hero of vehicle development. It's the stage where engineering leaves the controlled environment of the lab and confronts the real world. It's where prototypes face the unpredictable realities of rugged terrain, extreme temperatures, and relentless vibration. In this setting, every second counts, and every data point matters.

But as electrification, autonomous driving, and virtualisation transform the automotive landscape, the demands placed on mobile vehicle testing have never been greater.

Today's test and validation engineers are under pressure like never before. Prototypes are limited, timelines are shrinking, and the complexity of modern vehicles is skyrocketing. Traditional data acquisition systems – once cutting edge – are no longer keeping up. They struggle with higher channel counts, fail in harsh real-world conditions, and burden teams with fragmented workflows and integration challenges. When systems fail, critical test windows close – along with opportunities to validate designs, ensure safety, and maintain programme momentum.

This is the crossroads where mobile vehicle testing now stands. And it's clear that the future must take a fundamentally different path to better support the daily work.

The forces driving change

The industry is moving fast. Electrification is reshaping durability requirements for batteries, power electronics, and drivetrains. Autonomous driving is adding layers of sensors, controllers and software that demand synchronised, high-fidelity data. Virtualisation – through digital twins and advanced simulation – depends on accurate real-world data to validate models and close the loop between test and simulation.

Add to this the rapid expansion of 5G, edge computing and IoT connectivity, and the picture becomes clear: mobile vehicle testing equipment must evolve from a rugged, stand-alone hardware setup into a fully integrated, intelligent, and connected system – in one word: smart!

Modern vehicle durability programmes now demand more from testing equipment than ever before. Systems must withstand extreme environments, capture synchronised multi-domain data, operate autonomously for extended periods, and integrate seamlessly with increasingly complex vehicle architectures. As these pressures intensify, the next generation of mobile testing platforms

must excel across all these dimensions – providing a resilient, intelligent foundation that supports durability, road-load, and long-term testing without compromise.

The breakthrough

Fusion RX is HBK's next-generation mobile vehicle testing solution – and it represents far more than a new product. On the one hand it's built on decades of HBK leadership in strain gauge technology; on the other hand, it's the result of years spent listening to engineers, understanding their pain points, and rethinking what RLDA (Road Load Data Acquisition) should deliver in a modern testing environment.

Built for real-world extremes, Fusion RX is a modular, scalable, and robust system that thrives where traditional solutions fail. With IP65/IP67 protection, shock resistance up to 100 g, and an operating range from -40°C to $+80^{\circ}\text{C}$, it delivers reliability in the harshest conditions. Whether mounted on a defence vehicle in desert heat or capturing data on a railcar in sub-zero temperatures, Fusion RX keeps performing – without compromise.

Cloud-ready supporting software

But hardware is only half the story. The future of mobile vehicle testing depends on integration and intelligence. Fusion RX's supporting software is a cloud-ready platform that simplifies setup, enables remote monitoring, and unifies the entire process from configuration to analysis.

HBK delivers a complete measurement chain, connecting sensors, DAQ, and analysis software such as nCode GlyphWorks into one coherent experience.

No more juggling disconnected tools. No more concerns about data loss or incompatible formats. Just confidence that every test will run smoothly and deliver the insights that matter.



Real-world impact

Imagine an off-highway equipment manufacturer working with only a handful of prototypes and a tight testing window. With Fusion RX, setup takes minutes instead of hours, and data can log autonomously for days or even weeks, no matter how harsh the environment. Engineers can monitor progress remotely and access results instantly, accelerating decisions and eliminating costly delays.

Or picture a defence contractor validating vehicle durability across extreme terrain. Fusion RX's rugged design and distributed computing architecture deliver unwavering stability – even with 50+ analog channels running simultaneously, so no data is lost and no test is wasted.

Looking ahead

This is only the beginning. The next era of mobile vehicle testing will be defined by AI-driven analytics, predictive maintenance, and global collaboration through cloud-connected platforms. HBK is already building toward that future – one where engineers don't just capture data, but convert it into actionable insights that drive safer, smarter, and more sustainable vehicles.

The takeaway

Mobile vehicle testing is mission-critical, and the cost of failure has never been higher. The time to modernise is now. With Fusion RX and its supporting software, HBK delivers rugged reliability, flexible scalability, and intelligent, end-to-end workflows – empowering engineers to test without limits and lead the next chapter of mobility innovation.

Discover more with HBK

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