



## AUTHORS

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# Reducing Effort, Increasing Quality

## ETAS extends Test and Validation portfolio with Test Operations Services

ETAS is now offering independent, comprehensive Test Operations Services through its regional offices. Test Operations Services include requirements engineering, test specification, test case development, as well as test execution and reporting. These new services complement the existing ETAS portfolio of test process, infrastructure, and strategy consulting to create an end-to-end portfolio servicing OEMs and Tier 1 embedded system suppliers from the automotive and commercial vehicle industries. Customers benefit through higher flexibility, efficient execution, and independent quality assurance.

**With Test Operations Services**, ETAS is utilizing its deep experience in test processes and tools. Additionally, together with its group partner Robert Bosch Engineering and Business Solutions Limited (RBEI), ETAS leverages Bosch's vast know-how in automotive embedded system verification and validation. This enables ETAS to build on a workforce of over 600 test engineers specialized in powertrain, chassis system, body, infotainment, and E/E network integration.

Mike Badalament, Vice President Engineering Services and Test Consulting at ETAS GmbH, stated: "Optimizing test and validation is a multi-dimensional challenge. Key to achieving efficiency and reliable results is not only having the right test system – but also the right people, processes, methods, and test execution. We are pleased to extend our services offering and look forward to supporting our customers in the area of Test Operations to help enable more efficiency, speed, and quality assurance in test and validation."

### Efficient test development, execution, and management

ETAS testing services enable efficient test operation through a customized test process and infrastructure approach. They enable

the seamless re-use of test artifacts across development phases, test environments including all in-the-loop tests such as MiL, SiL, HiL, product variants, and organizational boundaries.

### Independent quality assurance

Based on its expertise in all automotive and commercial vehicle embedded system domains, ETAS is able to provide independent quality assurance of embedded systems and networks. ETAS Test Operations Services experts work in close cooperation with customers' development teams to generate test specifications, execute testing, and to make sure that findings and potential root-cause and corrective actions are fully understood.

### High flexibility

The ETAS Test Operations Services engagement models are flexible. The expert teams can execute test operations services independent of the customer's internal team. Alternatively, ETAS can provide highly capable on-site resources to supplement the customer's team. Regardless, technical project management is always provided by a local ETAS test engineering expert. Knowledge of ETAS tools is not a prerequisite, since ETAS Test Operations Services are offered independent of the customer's test environment.

Capabilities and scope of ETAS Test Consulting and Engineering Services

#### ECU and Subsystem Level Testing

- Functional validation
- Validation to standards (e.g., ISO 26262)
- Software verification
- Fault detection and fault management
- Network communication
- Network protocols
- Diagnostic reporting (e.g., OBD)
- Service tool integration
- ECU security and re-programming
- EEPROM stress testing
- HW/SW integration
- End-of-line test development
- Energy management
- Black, gray, and white box testing

#### Software and Software Module Level Testing

- Software verification
- Compliance to coding standards (MISRA)
- Unit testing
- Static analysis
- Critical resource utilization

#### Vehicle Level Testing

- System integration
- Functional validation
- OBD compliance
- Validation to standards (e.g., ISO 26262)
- OEM acceptance testing