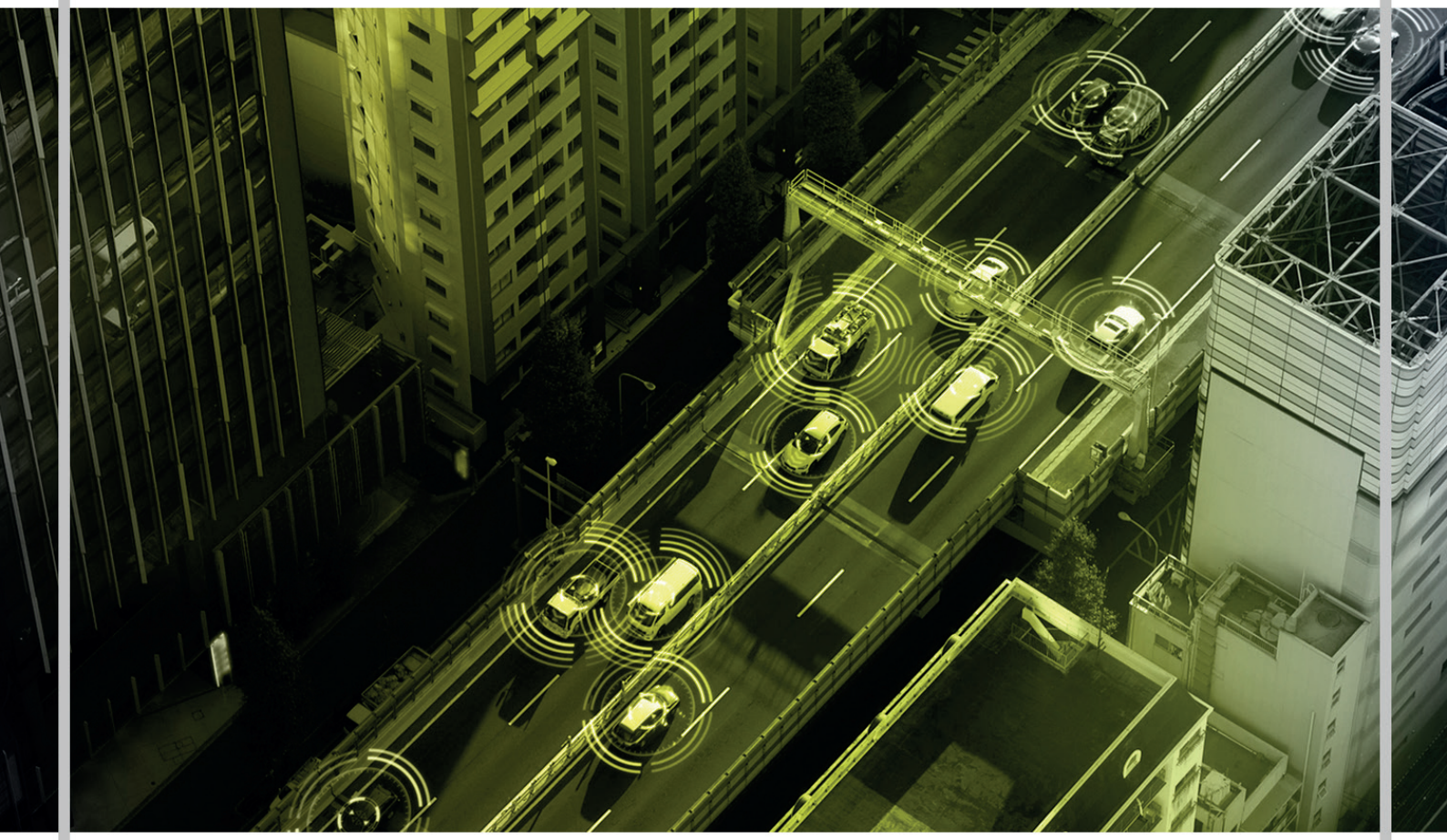
Averna
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# Advanced Solutions for ADAS Testing and Validation



Averna's **ADAS test solutions** provide the stable and repeatable conditions needed to thoroughly validate advanced driver assistance functions. By enabling consistent evaluation of radar, camera, and LiDAR performance, they deliver clear insights into system behavior at every stage of development. This leads to reliable data, streamlined workflows, and a solid foundation for safe assisted driving performance.

# Reliable and Scalable Test Solutions that Drive ADAS Innovation

- Sensor validation from early prototype checks to production
- Record and playback of real world situations that reveal system behavior
- Automated steps that keep processes smooth and consistent



Test Setup for all-in-one ADAS Test Solution

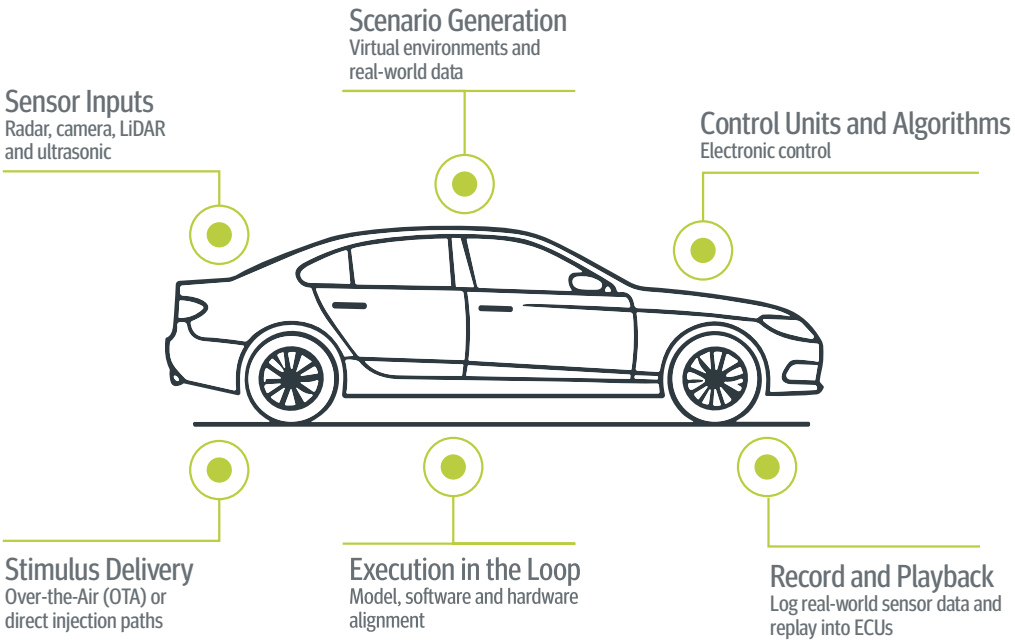
# ADAS Testing and Smart Data Management

With automated smart data management tools and efficient processes, Averna helps organizations maximize system reliability to create smoother development workflows.

## User Benefits

- Reliable and repeatable ADAS functions built on consistent test insights
- Solutions for validation and production
- Reduced workload through efficient preparation and execution
- Clearer decision-making supported by structured multi-sensor data
- Automated DUT handling for repeatability
- Faster test analysis through helpful event labeling
- Improved efficiency through real-world record and playback features
- Flexible adaption to new ADAS sensor types or functions
- Reduce costs through streamlined and manageable test processes
- Maintain strict takt times

# From Sensor to System — Every Component Perfectly Tested




**Realistic XiL Sensor Input**

Radar, camera, LiDAR, and ultrasonic inputs synchronize with virtual scenarios or recorded ADAS data to create repeatable XiL stimulus sets. Signals reach the ECU via over-the-air paths or direct injection to reproduce precise conditions in a lab or laboratory environment, supporting Hardware-in-the-Loop Testing with multiple sensors. The user's preferred virtual environment simulator can also be integrated to provide the required sensor data.

**Combined XiL Testing**

Sensor combinations and ECUs with ADAS/AD algorithms are evaluated across Model-, Software-, Hardware-, Driver-, and Vehicle-in-the-Loop configurations.

**Deterministic & Repeatable**

Unified timing enables deterministic playback of complex scenarios; reinjected recordings support reliable regression testing.

**Flexible Laboratory Integration**

A wide range of sensor options, adaptable test-signal paths, and integration with common simulation platforms support complete system-level ADAS validation.

Capture real-world signals and sensor data and bring them back to the lab through advanced record and playback functionalities.



| | Type | Parameter | Solution |
|---|---|---|---|
| **Performance Validation** | Radar (RF and electrical) | • RF performance<br>• Signal integrity<br>• Electrical functionality | • Direct signal injection<br>• Controlled RF test environment |
| | Camera (Optical and electrical) | • Optical quality<br>• Imaging accuracy<br>• Electrical responsiveness | • Integrated electrical measurement checks<br>• Virtual scene presentation in fusion testing<br>• Replay of recorded visual scenarios<br>• Automated electronic response testing |
| | LiDAR (Optical and electrical) | • Beam pattern<br>• Distance accuracy<br>• Component resilience | • Consistent LiDAR pattern reproduction within XiL<br>• Timed capture of LiDAR returns |
| **Environmental Validation** | Temperature | • Thermal stability<br>• Performance drift<br>• Performance under temperature extremes | • Temperature controlled enclosure<br>• Baseline scenario replay for comparison<br>• Timed measurements during thermal stress |
| | Humidity | • Moisture resistance<br>• Signal reliability<br>• Environmental robustness | • Humidity controlled chamber testing<br>• Reference data comparison under moisture<br>• Fusion scenarios run during humidity cycles |
| **Production** | Alignment | • Positioning accuracy<br>• Orientation repeatability<br>• Sensor-to-sensor consistency | • Automated alignment routine<br>• Repeatable scenario replay<br>• Synchronized multi sensor comparison |
| | Calibration | • Parameter tuning<br>• Measurement accuracy<br>• Sensor Synchronization | • Guided calibration routine<br>• Validation using reference scenarios<br>• Shared timing structure across sensors |
| | Built Quality Verification | • Mechanical integrity<br>• Assembly precision<br>• Defect detection | • Controlled functional checks<br>• Comparison to reference behavior<br>• Structured event tagging |

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