Mx-Suite™ is the most comprehensive automated platform for embedded software verification and validation. Its intuitive graphical interface and reports are understood by anyone in the organization. Mx-Suite streamlines the complete software development cycle by reusing requirement-based tests during:

- Model-based analysis and design (MIL)
- Software component development (SIL)
- Rapid prototyping target development (PIL)
- On target ECU testing (HIL)

- Executes a complete set of test cases ranging from a single ECU to an entire vehicle
- Connects easily to simulation models, C code, AUTOSAR applications, and test & measurement equipment
- Automatically runs regression tests every time a change is made for a feature, product enhancement, or bug fix
- Provides coverage metrics for ISO 26262 compliance
Benefits

- Finds bugs and highlights the root error symptoms
- Provides back-to-back testing and equivalence between models, software, and ECU behaviors
- Tests infotainment, powertrain, body, interior, cockpit, battery management, and safety/ADAS functions
- Reduces costs by automating and reusing test cases across all life-cycle stages, such as design, simulation, rapid prototyping, development, implementation, and integration
- Replaces multiple software tools with a single solution
- Promotes better team communication with graphical summaries and root symptom details

Highlights

- Out of the box support for popular application life-cycle management systems and continuous integration tools
- Seamless support for testing AUTOSAR implementations
- Integrates with industry standard test tools and network interfaces, such as CAN, LIN, Ethernet, MOST; and custom hardware interfaces
- Imports log files or record ECU signals & messages so engineers can edit and play them back as test cases
- Monitors tests as they run triggers other tests based on conditions or events
- Use different calibration sets with the same test cases to support ECU variants

Mx-Suite natively supports MC/DC analysis using Rapita Systems’ RapiCover extension. It supports the necessary artifacts required for ISO 26262 regulatory compliance with the optional Mx-Suite Tool Qualification Kit.
Streamlining The Development Process

Process Management Systems

Core Components

Test Executive and Scheduler ensures test stimuli reach the item under test or HIL in sequence and on time

Pass/Fail Analyzer determines the outcomes of each test and annotates the results with root failure symptoms

Simulation Engine provides a virtual vehicle environment to the system under test and simulates in-vehicle bus such as CAN, LIN, Ethernet, MOST, etc.

Extensive Library contains commonly used Connector Transforms, including machine vision and robotic interfaces

Connector Transform Editor connects Mx-Suite to popular modeling tools, vehicle networks, HIL test equipment and ECU implementations

Use Cases

Infotainment
Perform functional testing and system stability testing of components, such as radios, touch screens, system HMs, amplifiers, rear-seat entertainment systems, NAV systems, and mobile applications.

Body and Interior Electronics
Test body control modules, gateways, lighting modules, door modules, seat controls, and virtually any interior or body ECU.

Cockpit Electronics
Simulate subsystems in the vehicle that communicate with a cluster or HUD for complete functional testing of HMI, cluster instrumentation, NAV, turn-by-turn, vehicle status, and infotainment status.

Battery Management Systems
Fully test battery management system software for electric or hybrid electric vehicles with Mx-Suite’s support for MC/DC coverage for ISO 26262 requirements.

Powertrain Controls
OEMs select Mx-Suite for HIL automation software because it increases productivity and helps manage large volumes of tests cases using built-in tagging and metadata features. Mx-Suite supports National Instruments, dSPACE, ETAS, and others systems out of the box.

V2X / DSRC Testing
Mx-Suite includes USDOT certification tests for DSRC components. Users can extend the tests and add hardware interfaces for comprehensive testing of a device. Mx-Suite is being extended to provide a simulated mobility environment of DSRC nodes to test application virtually on a PC or on-target.
**Universal Connectivity**

**Connectors**

Mx-Suite can connect to any embedded control implementation. A standard library of Connector Transforms convert interface messages and signal values to better understood units (for example, counts to volts, bits to enumerated values, CAN payloads to signal definitions, etc.). Mx-Suite allows developers to write their own custom transforms to transform signals, communicate with applications, or connect to device driver APIs.

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<th>Process Management Software</th>
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<td>Jenkins</td>
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</table>

**Communications**

- **Networks**
  - CAN/CAN-FD (ISO 11898)
  - LIN (ISO 17987)
  - DSRC (IEEE 802.11, IEEE 1609, SAE J2945/1)
  - Ethernet / OPEN Alliance
  - MOST
  - RS-232
  - Bluetooth

- **Protocols**
  - ASAM XCP / CCP
  - ISO 15765 Diagnostics (ISO-TP)

- **APIs**
  - Android Debug Bridge API
  - iOS API
  - Ford SYNC

- **Embedded Environments**
  - National Instruments LabView
  - Mathworks Simulink Stateflow
  - IBM Rhapsody and Statemate Models
  - Vector DaVinci – AUTOSAR

**Additional Product Extensions**

- **Mx-PLT CAN/LIN Physical Layer Tester** checks ECU conformance to OEM standards
- **Mx-DSRC Test System** provides ISO, IEEE, and SAE V2X certification tests
- **Robotic Touch Interface** interacts with touchscreens for HMI testing
- **ISO 26262 Tool Qualification Kit** produces the required documents for approval by authorities

**Other Tools**

- **OmniAir**
- **TUV SUD**

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