Mx-Suite™ is industry-proven software for verification and validation (V&V) that runs on Microsoft Windows®. With its powerful behavior diagrams, test cases are specified in terms of inputs, expected outputs, and tolerances. Mx-Suite™ can record data from experiments or import field data as acceptance criteria. Test your development concepts using virtual prototypes, well before electronics are available.

Mx-Suite™ is used to test simulation models, software code (developer-written or auto-generated), and vehicle electronics. Danlaw provides the tools, training, and custom services to take the hassle out of developing powertrain, body electronics, active/passive safety, and other embedded systems.

**Mx-Suite™ Advantages**

- Test case portability across simulation models (MIL), software (SIL), and hardware (HIL)
- Seamless support for development within AUTOSAR and ISO-26262
- Replaces multiple test tools with a single universal tool
- Quickly implements test cases with an easy and intuitive GUI
- Supports industry standard test tools, CAN/LIN/MOST networks, and custom hardware interfaces
- Performs white box and black box testing on functions, modules, or complete virtual subsystems
- Records ECU behavior and supports edit and play back of behavior as test cases
- Imports ECU test and log data from other tools as test cases
- Automatically creates easy-to-understand test reports
- Identifies root causes of system and function errors
Mx-Suite™ Components

- Mx-VDev™ Universal Test Software (includes Test Editor, Test Reviewer, Test Executive and Report Generator)
- Mx-Sim™ Simulation Engine to provide the vehicle environment to the system under test
- Mx-TransIt™ interfaces for popular modeling tools, vehicle networks, HIL test Equipment, and ECU implementations
- Mx-Net™ Stream Connector for real-time HIL testing, with unlimited connectivity and distributed testing capabilities

Description of Mx-Suite™ Components

- Mx-VDev™ (includes Test Editor, Test Reviewer and Report Generator)

Mx-VDev™ can import system data and behaviors as test cases, create new test cases, schedule/execute test cases, and generate test reports. It provides the right level of information to users, whether high-level executive summaries for the program management team, or detailed root symptom/causes for product engineers. Its powerful regression-testing feature allows unmanned testing to occur during off-hours so that test reports are available during business hours.
**Mx-TransIt™ Virtual Wiring Harness Editor**

Mx-TransIt™ uses common library blocks called “transforms” that connect your test cases and scenarios to your system-under-test, whether they are simulation models, software code, or electronics. It allows you to express your test case inputs and outputs using well-understood naming conventions and engineering units (e.g., RPM, torque ft-lbs, alternator voltage, cranking amps,...) for maximum readability. You can design your own transforms or use Mx-Suite’s built-in transforms to connect with popular modeling tools, virtual ECU implementations, and HIL test equipment. Mx-Suite™ supports MathWorks, dSPACE, National Instruments, Vector, Intrepid, Opal-RT, and other commonly used test equipment. Mx-Transit™ keeps your test cases readable as they were meant to be.
• **Mx-Sim™ Cosimulation Engine**

The Mx-Sim™ Cosimulation feature allows you to test plant and control models in a PC workstation using popular modeling tools, such as MathWorks Simulink®/Stateflow®, National Instruments LabVIEW®, or C-coded algorithms. It can simulate vehicle networks over CAN/LIN/MOST. It allows you to connect different tool simulations with each other. Whether you want to cosimulate virtual simulation models, virtual ECUs, or with HIL equipment, you have full test case portability.

![Simulink Model](image1)
![LabVIEW VI](image2)
![C Code](image3)

*Figure 7- Cosimulate any combination of MIL, SIL, or HIL implementations*

• **Mx-Net™ Stream Connector**

The Mx-Net™ Stream Connector provides high-speed networking and test data delivery for real-time HIL systems, and supports HIL equipment from dSPACE, National Instruments, Opal-RT, add2, and Vector. It ensures the timely delivery of test data from Mx-Suite™ to the HIL test system so that real-time deadlines are met. Mx-Net™ also keeps time clocks synchronized between Mx-Suite™ and the HIL system keeping the test data consistent. Danlaw's engineers can easily customize Mx-Net™ to support any real-time test equipment, providing unlimited connectivity and testing capabilities.

**Mx-Suite™ Value Proposition**

Mx-Suite™ enables automotive embedded controls teams to:

- Speed up the development process
- Consolidate embedded controls validation tools
- Reuse validation work throughout the development life cycle
- Communicate requirements effectively to suppliers and offshore teams
- Prove that design meets requirements

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