



One for All

ASAM XIL API decouples tests of all test stages from the test platform



Efficient ECU testing requires reusable test cases that can be applied throughout the complete development process to achieve consistent test conditions. The XIL API standard provides the basis for this. It lets users set up test cases in the same manner – independent of test stages and platforms.

The successor to the HIL API standard, the ASAM XIL API standard V2.0, which was released in 2013, is the current standard for testing ECUs and simulating their environments. The X in the name symbolically represents the versatility of this standard, which can be used across different manufacturers and development stages. It supports developers of ECUs and test systems throughout the complete development and test process, which includes model-in-the-loop (MIL), software-in-the-loop (SIL), processor-in-the-loop (PIL), and hardware-in-the-loop (HIL) simulation.

A Standard That Opens New Doors

There is an abundance of companies in the market, and the number of software and hardware solutions for testing ECUs and simulating their environment is just as countless. This means: Components can be combined with one another without any problems only if they all have the same interfaces. For this purpose, renowned representatives of the automotive industry developed the XIL API standard. By supporting this standard, dSPACE shows its open-

ness towards third-party products: If necessary, these products can be integrated into the seamless dSPACE tool chain extremely fast and without prior configuration.

ASAM XIL API

XIL API is designed to be an active standard. The ASAM XIL API workgroup is focused on continuously developing and optimizing the standard to meet new customer requirements. Regular XIL cross tests are performed to ensure the high quality of the standard. During these events, end users and tool suppliers define the use cases and functions to be tested, incorporating direct feedback from the real world into the optimization process.

To cover the diverse tasks in the areas of simulation and testing, several standardized interfaces with different functionalities are available for the simulation platforms. The XIL API Model Access Port (MAPort), for example, allows for read/write access to the simulator as well as the stimulation and the measurement data acquisition in all phases of the development process. Electrical error states, such as short circuits and interruptions caused by a Failure

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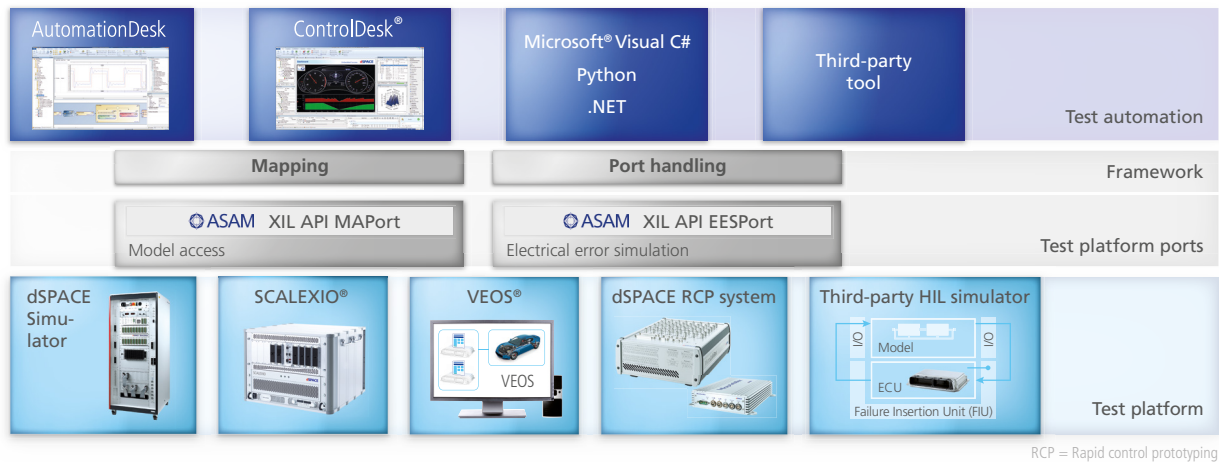


Figure 1: Because dSPACE products support the interfaces XIL API MAPort and XIL API EESPort, they can be effortlessly combined with XIL API-compliant products of third-party suppliers.

Insertion Unit (FIU), can be controlled via the XIL API Electrical Error Simulation Port (EESPort). XIL API benefits from using additional standards, among them ASAM Measurement Data Format (MDF) for saving measurement data and ASAM General Expression Syntax (GES) for the standardized description of trigger conditions, such as starting and stopping measurements and stimulations.

New Features

Today, the ASAM XIL API standard is a staple in the world of simulators – many users have already switched to XIL API to benefit from the new functionalities. An important innovation is the additional abstraction layer (framework) between test automation and simulation platform. It lets users transfer test cases to dif-

ferent test systems and reuse them throughout the complete development process – from MIL to SIL, PIL, and HIL. An important function of the framework is mapping: For this, aliases are assigned to the actual simulator variables to let users access the variables independently of the respective model structure. Thanks to this abstraction, the tests can be set up in the same manner and reused independently of the simulation platform or the test stage. Changes in the model can be maintained centrally in the mapping of the test tool. A cross-platform and cross-test stage use of the same test tools significantly minimizes the training effort for employees and simplifies the knowledge transfer between different teams. Because the XIL API interface sup-

ports all .NET-compliant programming languages, such as Visual Basic .NET, C#, Python, and MATLAB M scripts, it can be easily integrated into different tools.

XIL API in dSPACE Products

As one of the ASAM founding members and a member of the XIL API workgroup, dSPACE has been actively participating in implementing and optimizing the XIL API standard since the very beginning. Whenever the standard is improved, dSPACE implements these improvements into its products in a timely manner. Thus, all HIL API interfaces were replaced by new XIL API interfaces for dSPACE Release 2016-B. The new XIL API interfaces fully cover the old RTPLib and HIL API functionalities and add new features.



“Thanks to XIL API, tests can be reused across all development stages, and products from different manufacturers can be combined. This creates an unprecedented freedom for choosing products and at the same time ensures continuity during testing.”

Dr. Rainer Rasche, head of the ASAM XIL API workgroup and group manager in Product Development at dSPACE GmbH



For uniform access from test automation tools such as AutomationDesk to all dSPACE simulation platforms, the Platform API Package features the XIL API MAPort server. In the Failure Simulation Package, the XIL API EESPort server supports uniform access to dSPACE Failure Insertion Units. ControlDesk® includes the XIL API MAPort platform, which can be used to seamlessly connect simulation platforms from third-party suppliers or measurement tools, for example. This way, measurement data of third-party and dSPACE platforms can be recorded time-synchronously in ControlDesk, visualized in a plotter, and compared in one time domain. With the XIL API EESPort GUI component, which is integrated in ControlDesk, electrical error states can be configured and applied interactively via a uniform graphical user interface in ControlDesk. The Signal Editor in ControlDesk and the editor for signal-based testing in AutomationDesk use the XIL API standard to describe the signal waveforms for the stimulation and description of the reference signals in a standardized manner. It is possible to define and exchange complete tests in AutomationDesk by adding small enhancements to the signal description.

Switching Made Easy

For AutomationDesk users who already worked with HIL API for model access, the switch to the corresponding XIL API happens automatically. Users who created tests on the basis of scripts and now want to switch to XIL API receive comprehensive support for their migration process through documentation in the dSPACE Support Center or by the dSPACE Support team. If necessary, employees from the dSPACE Engineering team will assist users with the migration process, so nothing stands in the way of using the powerful XIL API standard. ■

XIL Cross Tests

To check the compatibility of test systems across different suppliers in the automotive industry, renowned suppliers of development tools regularly conduct XIL cross tests. During these tests, they connect their test tools to platforms of third-party suppliers to evaluate whether their test software can communicate with the test hardware of other manufacturers without problems. On July 13 - 14, 2016 cross tests were carried out at dSPACE in Paderborn.

For more information on this event and the cross tests in general, refer to the dSPACE website: www.dspace.com/go/xil_crosstests

Support

For more information as well as documentation supporting the migration, refer to: www.dspace.com/support