

CREATING VEHICLE SOFTWARE FASTER AND MORE EFFICIENTLY

Today's vehicles rely upon millions of software code lines to function safely and efficiently. The days of writing a lot of that code by hand are long gone, thanks to Model-Based-Design (MBD) and automated tools that quickly translate intended functionality into streamlined and high-quality, production-ready code.



Ulrich Eisemann

The global auto industry has relied on one powerful tool—dSPACE's TargetLink—more than any other over the past 15 years to safely and effectively generate the ever-increasing volumes of application software in cars. The Paderborn, Germany-based company says tens of millions of vehicles on the road today contain TargetLink-produced code. Ulrich Eisemann, the senior product manager for TargetLink, describes the reasons why customers prefer TargetLink to create software for controlling everything from engines, transmissions, electric powertrains, and vehicle dynamics to body and infotainment systems.

What makes TargetLink different from other automatic code generating tools?

It isn't difficult to generate software code automatically. The challenge is to seamlessly bridge the design process and environment of the controls engineer in the MBD world with the real-world needs of software engineering. A production-quality result must be delivered that passes the most stringent tests, rather than something that requires significant tweaking and refinement before it's ready to go into service.

While TargetLink is well known and proven for the quality of code it generates—efficient, highly configurable and extremely reliable, it is the company's philosophy and strategic vision behind this product that makes the difference. dSPACE is keenly focused on production-oriented software quality and making it safe in vehicles.

More than 15 years ago, TargetLink drove innovation of translating control system concepts designed with the de-facto standard for control design software (Simulink), by delivering the best-in-the-class production code-generator to translate those designs into production-grade software. Beginning from 1999, dSPACE has continuously evolved TargetLink and an ecosystem of tools to make code generation an easy-to-deploy toolchain for production software for small-to-large global organizations. TargetLink is backed by an industry-acknowledged, exemplary technical support organization.

How do developers know that automatically generated code will work as intended?

It is often cited that code writing is 20% of the effort and the remainder is testing. However, we firmly believe that producing high-quality, reliable code simplifies the testing effort. Therefore, we put tremendous effort in ensuring that TargetLink produces code that is proven best in all benchmark studies.

TargetLink blends advanced software engineering practices together with MBD in a very simple, user-intuitive environment to deliver code that matches the intent of the designer, while providing means to verify that the intention is

satisfied. Beyond code generation, we understand the need for testing. As a company strategy, we have partnered with the best technology providers to develop an ecosystem of tools that provide unparalleled testing capabilities to engineers.

What is the value of being able to generate code automatically and independently from the modeling environment?

TargetLink users have come to recognize the value this software provides for required objectivity and focus necessary for production programs. From a business perspective, it establishes a clear responsibility, focusing on code generation, without any conflicts with other aspects of MBD.

How has the product changed since it was introduced 15 years ago?

TargetLink-generated code has been in series production ground vehicles since 2000, and it has been flying in production commercial aircraft since 2002. In the beginning, customers focused on code quality, maturity, correctness, etc. As TargetLink has surpassed these expectations, the focus has shifted to work flows and engineering in global environments, and compliance to standards. TargetLink evolved with various features that have truly enabled globalized product engineering through data management, certification, and providing work process guidance for compliance with standards, etc.

How does TargetLink support the AUTOSAR and ISO 26262 standards?

Since 2006, we have been a strong contributor to AUTOSAR. TargetLink has evolved together with the needs of OEMs and suppliers that are at the forefront of pushing MBD technology with standards like AUTOSAR. TargetLink is the key component of their toolchains, and we have responded to their needs with a high-level of product maturity, offering capabilities that are available long before the standards are finally adopted.

Together with OEMs like Audi, we have successfully transitioned from proprietary to AUTOSAR-based software environments. Enabling such transition and making adoption of standards easier is a key component of our product strategy. TargetLink is certified for use by TÜV SÜD, an international certification organization, for the highest levels of safety-related software applications, according to ISO 26262.

What level of growth does dSPACE expect?

With increasing software content and sophistication of software driven features, we are seeing the increasing use of TargetLink. As a result, we are experiencing accelerated growth and expect this to continue into the future.

Click [HERE](#) to learn more about dSPACE and TargetLink, or visit www.dspaceinc.com/go/targetlink

