M dynamiX

MdynamiX and Ansible Motion partnership: HiL and DiL integrations for early-stage development of braking, steering and ADAS

Benningen, 17.09.2024 – MdynamiX, specialist in real-time Hardware-in-the-Loop (HiL) solutions, and Ansible Motion, specialist in Driver-in-the-Loop (DiL) simulation, have formalised a long-standing relationship to enhance the development of steering, braking, and advanced driver assistance systems (ADAS). This new partnership aims to enable engineers to experience and evaluate representative vehicle systems early and often during the development process by combining real, deployable hardware and software with virtual vehicle assessment capabilities.

MdynamiX's comprehensive steering HiL and wet braking HiL solutions offer dynamic real-time HiL capabilities that can be seamlessly integrated into Ansible Motion's DiL simulator environments. The realistic steering and braking feel resulting from the integration of real components and control software provides development and test engineers with a highly innovative simulation environment for the development of steering, braking, and ADAS functions, as well as the possibility of complete-vehicle subjective and objective evaluations in a virtual environment. Additionally, it facilitates the preliminary calibration and implementation of Electric Power Steering (EPS) and Electronic Stability Program (ESP) systems in a human-centric manner.

Partnership Highlights

Currently, there is a growing presence of driving simulators in vehicle development programmes among OEMs and Tier 1 suppliers across China, Korea, the USA and Europe, that has been prompted by reduced physical prototype availability due to cost, resource constraints and sustainability initiatives. Reflecting this growing reliance on DiL simulators is an increased demand to shift certain testing and development procedures into simulation and virtual development spaces. This is driving new innovations to expand the possible use cases for comprehensive simulations and enhance virtual vehicle assessment capabilities. In order to meet these shifting market and customer requirements, it is essential to ensure seamless workflows across traditional simulation

environments such as Software-in-the-Loop (SiL) and Model-in-the-Loop (MiL), advanced HiL and DiL simulations, all the way through to physical vehicle testing.

In regard to the newly formed alliance with Ansible Motion, MdynamiX CEO Prof. Bernhard Schick made the following statement:
"*We are taking a further step in our close partnership with Ansible Motion, one of the world's leading simulator manufacturers. We will contribute our methodological expertise in end-to-end MIL/SIL/HIL simulation and test driving on the driving simulator, especially in the areas of steering, chassis, vehicle dynamics, comfort, ADAS/AD and UX/HMI. As a specialist in steering feel, we know how important good steering feel in the driving simulator is for acceptance and good results. With our end-to-end MIL/SIL/HIL solutions, we create the world's best steering feel, taking Ansible Motion's driving simulators to a new level. Especially when classical MIL/SIL/HIL simulation reaches its limits and the subjective impression and tuning competence of the test driver is the next step, the driving simulator with real components generates a significant advantage. The result is earlier, better decisions and faster development.*"

Dan Clark, managing director of Ansible Motion, commented on the extended collaboration with MdynamiX, stating:
"*Prototype vehicles often arrive too late in a development program, or with restrictive scheduling constraints that limit the time available for fine-tuning the attributes that are crucial to establishing brand identities. With MdynamiX, we have found an experienced partner whose HiL solutions can be seamlessly integrated with our DiL simulators. We have the largest installation base of dynamic DiL simulators across the globe, which gives us a unique perspective on applications, use cases and customer requirements. By utilising our in-house, real-time integration capabilities, along with MdynamiX's expertise in HiL systems, we are creating an expanded set of digital product development tools. Following several years of fruitful collaboration with MdynamiX, we are now poised to embark on a new phase of exciting joint projects to benefit our customers.*"

Technology Overview

MXsteerHiL and MXsteerLink: A dynamic real-time HiL test bench environment designed for Electric Power Steering (EPS) and Steer-by-Wire (SbW) systems. The modular kit offers flexibility from laboratory to simulator environments, enabling

the evaluation and calibration of steering systems and Advanced Driver Assistance Systems (ADAS) in the early stages of development.

MXbrakeHiL and MXbrakeLink: An advanced test bench for brake systems, specifically developed for electric and automated vehicles. This versatile test bench, compatible with various real-time systems, is optimized for the model-based development of electronic stability control systems (ESC) and advanced safety functions. By integrating the entire hydraulic/electromechanical/electrical brake system into the real-time environment, from the pedal to the calipers, MXbrakeHiL streamlines development and validation tasks across all technological maturity levels.

Ansible Motion DiL simulators: A range of turn-key Driver-in-the-Loop solutions, ranging from small-scale, static simulators, to full-size, dynamic simulators. The Delta series – which includes the award-winning Delta S3 DIL simulator – is Ansible Motion's flagship range of high-fidelity, high-dynamic, human-centric dynamic DIL simulators intended for automotive product development work such as expert driver evaluations and attribute assessments. All Ansible Motion DIL simulators share a common, open software architecture that invites customer and technical partner collaborations.

Image material:

Image1:

Image1 text:
From left to right: Tristan Schwandke (MdynamiX), Salman Safdar, Dan Clark (Ansible Motion), Peter Pfeffer (MdynamiX), Stefan Vorderobermeier (Ansible Motion), Bernhard Schick (MdynamiX).

Image1 credits:
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Image2:

Image2 text:
Steering test bench of MdynamiX, MXsteerHiL

Image2 credits:
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Image3:

Image3 text:
Ansible Motion Delta S3 Driver-in-the-Loop simulator in an ADAS test scenario

Image3 credits:
Ansible Motion

About MdynamiX AG

MdynamiX is innovation partner in solving complex research and development tasks in the automotive industry. Founded in 2014, the company's focus is on the individual with their emotional needs and their demand for a comprehensive and attractive driving experience. MdynamiX's fields of expertise include vehicle dynamics & ride quality, automated driving (ADAS/AD), as well as acoustics & vibrations. MdynamiX offers its customers methods and solutions for effective and efficient development of brand- and model-specific characteristics. These include software and hardware tools as well as research and development services using the most sophisticated simulation and test environments. The MXacademy trains engineers to be ready for the challenges of the future. As an affiliated institute of the Munich University of Applied Sciences and partner of the

Kempten University of Applied Sciences, MdynamiX has direct access to the latest research knowledge and modern facilities.

About Ansible Motion

Founded in 2009, Ansible Motion creates and deploys technology associated with the physical and logical simulation of human-experienced vehicles. We offer a range of automotive Driver-in-the-Loop (DIL) simulators featuring advanced computational and mechanical performance capabilities, and industry-unique motion and immersion solutions that create compelling virtual worlds for drivers and product development engineers. Ansible Motion DIL simulators are used by automotive and research organisations around the globe to place real people into direct contact with imagined vehicles, on-board systems and situations. Our DIL simulators are designed, built and developed at our factory and R&D Centre in Hethel, England. In 2022 we were acquired by AB Dynamics plc.

Press contact

Kristina Wolf
kristina.wolf@mdynamix.de
MdynamiX AG