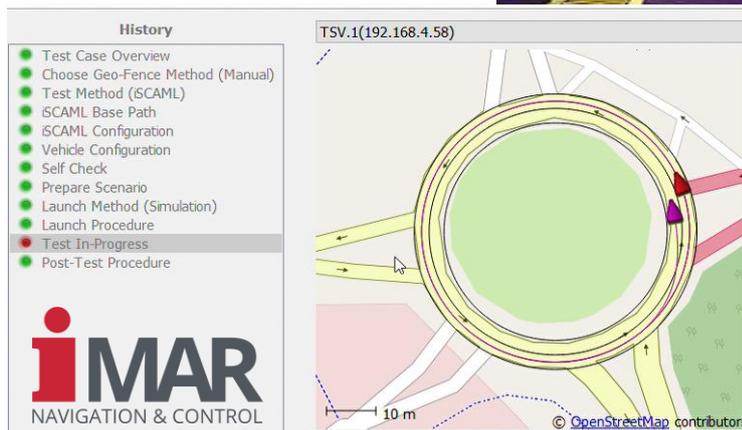# IPG Automotive and iMAR Navigation: Seamless Workflow from Simulation to Real-World Testing on the Proving Ground

ST. INGBERT / KARLSRUHE, MARCH 2021: **iMAR Navigation GmbH (St. Ingbert) and IPG Automotive GmbH (Karlsruhe) combine their expertise in simulation and real-world vehicle testing to provide a powerful, holistic toolchain for scenario-based testing. The cooperation aims at saving costs and time in vehicle development processes.**

Vehicle testing in the field of automated driving is becoming more and more complex, the number of test cases increases continuously and test requirements are shifting from basic single object tests to scenario-based testing with multiple interacting participants. To master these challenges, it is crucial to merge simulation and real-world testing and to apply an automated toolchain that is able to process the immense workload.

iMAR Navigation, a pioneer of real-

iMAR's iARGUS-CMD Control Center Software and IPG's CarMaker now have common interface to provide a holistic toolchain for automated driving tests

world scenario-based testing applications, and IPG Automotive, a leading supplier of innovative simulation solutions for vehicle development, identified the missing interface between simulation and testing on the proving ground. To close the gap, they jointly developed a holistic toolchain combining both test approaches.
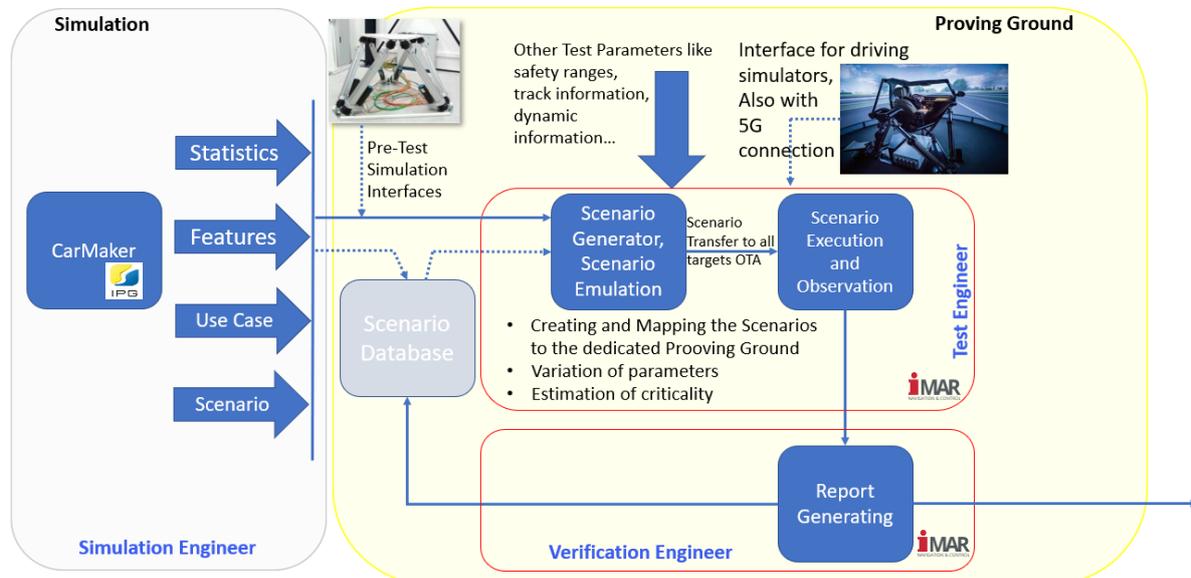
It enables customers to optimize their test runs by reducing errors, making optimal use of the proving ground and saving costs and time.

The toolchain encompasses scenario planning and test runs with varying parameters of any NCAP test as well as advanced scenarios in IPG Automotive's simulation software **CarMaker**. Configured scenarios and test runs are transferred directly to the **iARGUS-CMD** software for iMAR's proving ground control center. This software manages the real-time control of all dynamic test objects on the proving ground, such as vehicles under test, traffic simulation vehicles, soft crash targets or driving robots. Other external factors, for example traffic lights, weather conditions etc., are also considered.

The exchange of the scenario description between both parties is based on iSCAML – iMAR's Scenario Advanced Meta Language – that is to become part of the future ISO 22133 standard. In addition, there is also an OpenX to iSCAML converter included in the toolchain, allowing for import of OpenScenario files. For test reporting, the joint toolchain also provides standardized interfaces to transfer test data into any data analysis software after test execution and to feed data back into simulation and / or control center software.

With this new toolchain, **IPG Automotive** and **iMAR Navigation** offer users the possibility to prepare and carry out vehicle tests much more efficiently.

Find more information here:

https://www.imar-navigation.de/en/products/by-product-names/item/iswaco-argus-proving-ground-infrastructure-for-testing-vehicles-up-to-sae-level-5

https://ipg-automotive.com/products-services/simulation-software/carmaker/

iMAR Navigation GmbH
Im Reihersbruch 3
D-66386 St. Ingbert

As a worldwide operating leader in inertial navigation, stabilization, guidance and surveying technology, iMAR Navigation develops innovative solutions for production well as for testing systems. Beside of the common solutions for navigation, surveying and stabilization in aviation, train systems, marine applications, sovereign applications etc., in the area of road vehicle motion testing iMAR provides most advanced solutions for testing manned and unmanned vehicles on proving grounds and public roads for the world of today and tomorrow for more than 25 years, to make road traffic safer.

Further information at https://www.imar-navigation.de

IPG Automotive GmbH
Bannwaldallee 60
D-76185 Karlsruhe

As a global leader in virtual test driving technology, IPG Automotive develops innovative simulation solutions for vehicle development. Designed for seamless use, the software and hardware products can be applied throughout the entire development process, from proof-of-concept to validation and release. The company's virtual prototyping technology facilitates the automotive systems engineering approach, allowing users to develop and test new systems in a virtual whole vehicle.

IPG Automotive is an expert in the field of virtual development methods for the application areas of Autonomous Vehicles, ADAS, Powertrain, and Vehicle Dynamics, committed to providing support to master the growing complexity in these domains. Together with its international clients and partners, the company is pioneering simulation technology that is increasing the efficiency of development processes.

By taking real test driving into the virtual world as a complement to on-road testing, IPG Automotive contributes significantly to technical progress and shares in shaping the mobility of tomorrow with regard to comfort, safety, economic efficiency and environmental friendliness.

In addition to the company headquarters in Karlsruhe, Germany, IPG Automotive provides innovative development services to its clients and partners at the national offices in Braunschweig, Frankfurt, Munich and Stuttgart as well as in China, France, Japan, Korea, Sweden, UK and the USA.

Further information at www.ipg-automotive.com