



Insight

Automotive

ELECTRIC
HYBRID
DIESEL

**AUTOSAR Systems –
Quality Assurance and
Architecture Evaluation**

**Hybrid Propulsion
Systems –
HiL Test Setup for Validation**

**TESTUS –
Efficient and Secured Test
Management with ISO 26262**



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PREFACE



Dear Reader,

Our subsidiary in Stuttgart celebrates its 10th anniversary this year! On this special occasion, we would like to present this site with the current issue of our semi-annual newsletter "Insight Automotive".

The site has grown considerably in the last few years, employing about 70 professionals today. We are pleased to still be working in projects and follow-ups we started our first activities with 10 years ago. This demonstrates our customers' confidence in us and the high significance we attribute to a strong and long-term customer relationship.

Many things have changed over the last decade. Topics that belonged to

the field of research a few years ago are now state of the art, such as the HiL test. The challenge today is how to exploit the potential for optimization, namely with new, innovative business models for HiL operation and groundbreaking technologies such as the MESSINA-HiL.

Our comprehensive service portfolio covers the entire system development cycle of control devices for automotive applications - from the functional specification via the implementation through to HiL integration testing. Moreover, supporting processes are getting increasingly important, such as assurance, diagnostics, test management and qualification. In the area of embedded systems, our services

range from the specification of telematics functions through to testing of exhaust gas aftertreatment systems for heavy commercial vehicles.

New technologies are becoming more and more important to us, such as driver assistance systems, hybrid drives and AUTOSAR. The intense and nationwide exchange across all Berner & Mattner sites and the rapid internal knowledge-building associated with it, in particular, have proven to be successful for these technologies.

Enjoy reading.

Dr. Ulrich Alsmann
Branch Manager Stuttgart

New Operational Concept for HiL

Efficient and cost-effective testing

For more than 9 years now, Berner & Mattner has been responsible for verifying electrics and electronics for the interior, the driving dynamics and the powertrain for Daimler. Based on the long-standing testing experience and a deep system understanding, Berner & Mattner has developed a new operational concept for HiL integration and component test systems in cooperation with Daimler. The new concept has proven to be used very successfully since 2009.

The new operational concept can easily be tailored to new customer processes and needs at any time, and, subsequently, be changed back to production mode quickly and efficiently due to the existing, large test team.

A new way of thinking desired

The desire to optimize test operation costs and to compensate alternating workload of model series test teams caused by the release cycles was the driving force to introduce new HiL operating concepts. The new operational concept has been tailored specifically to these requirements.

Implementation

As one of the first measures, the structure of the test teams has been optimized. In addition to the existing skills, all team members have been trained to become function specialists with respective representatives, significantly reducing coordination efforts and com-

pensating resource bottlenecks more easily.

Subsequently, tasks have been categorized, assigned to skill levels, and their work amounts have been quantified. As a result, clear qualification profiles allow for a more efficient test team. Furthermore, new communication channels, interfaces and roles to be taken over by the experts have been defined in a communication model, resulting in optimized project coordination processes.

The optional involvement of Berner & Mattner experts in a near-shoring approach also allows for a significant increase in flexibility and improvement of workload coordination.

Result

Introducing the new operational concept for HiL has resulted in high test quality and customer satisfaction due to the clear structure of interfaces and communication channels as well as the increased transparency of activities and results. Further benefits are cost advantages to the amount of ten to twenty percent compared to conventional concepts. The introduction of a functional test team structure and a well thought-out role definition lead to success in many ways. Efficient, high-quality and cost-effective testing is possible after reaching a critical mass of 10-13 cross-working experts – according to the operational concept developed by Berner & Mattner.

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Vehicle © Daimler AG



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No ECU Test Without Environment

Berner & Mattner conducts the entire environment simulation of all ECUs incorporated in the car interior for 8 model series, the E, M, C and S Class, amongst others. This includes, for example, the environment model for Parktronic or the remaining bus simulation for AUTO-SAR Flexray.

Simulations – reasonable and necessary

The prerequisite for an ECU test under lab conditions is a real test environment. The test requires plausible values at the inputs of the ECUs and the bus communication as well as logical output signals. The position of the window regulator should thus be calculated from the duration of its activation. The environment, replicated by the simulation, must then react to the behavior of the ECU, such as by blocking the window regulator motor when reaching the limit stop. For this purpose, simulations are extremely useful and indispensable.

Models for the vehicle test

In addition to test hardware, test software and the actual tests, a successful MiL, SiL or HiL test also includes the relevant models. These create a realistic test environment for ECUs, configured and controlled by the tester - the prerequisite for efficient and meaningful testing.

Simulations also replace real parts, such as window regulators, hydraulic units or rotation sensors, which are not available for HiL testing. The communication behavior of non-existent engine or gear box ECUs can be simulated on the bus-side, as well. Providing information in respect to the simulated environment, such as window regulator position or wheel speed, significantly eases work for the tester.

Mastering challenges

When creating simulations, there are different challenges. On the one hand, models have to be precise enough for the ECU to recognize them as realistic and to show the desired behavior. On the other hand, they have to run fast and efficiently within the boundaries of

the HiL hardware to keep down costs. In addition, the simulation needs to be intuitively operable by the testers, providing them with best possible support during their tasks.

The modelers at Berner & Mattner are prepared for these challenges. Many years of experience in ECU development and in the specification, setup and operation of HiL systems offer an ideal combination of accuracy and efficiency. Qualified and experienced testers provide intuitively operable models. The high model quality, in turn, leads to high test efficiency, thus resulting in high customer satisfaction.

Safe with TESTUS

ISO 26262 places new challenges for test management

Still in 2011, the final version of the new safety standard ISO 26262 is to be published. This standard, interfering with the entire development and test process, describes a method for ensuring adequate functional safety for safety-relevant vehicle systems. The test management solution TESTUS, developed for the Daimler commercial vehicle sector (Powertrain), already provides efficient support for some of the new challenges resulting from the ISO 26262.

Many ECUs, many functions, many variants, many test cases, manual test execution in test vehicles and automated at test stands – these are only some of the requirements a test management system has to meet in the automotive sector.

Test management in automotive

Many projects are organized using chart, text or XML files. Stand-alone solutions are used for test preparation, test execution and test evaluation – linking these sub-processes manually is often time-consuming and expensive. Test management tools used for computer software development can only be utilized to a limited extent in the automotive sector as they do not meet the requirements such as combining manually executed vehicle tests and

automated tests at Hardware-in-the-Loop (HiL) test benches or providing documentation in case of safety-critical systems.

TESTUS optimizes test process

TESTUS covers these requirements and supports the test process from the specification to the management of variants and test packages through to the test result and its evaluation. Everything in TESTUS is versioned: from an easy test case to the test result with its test configuration, thus ensuring the traceability required by ISO 26262 – from test specification to test result and vice versa. All test process data is available in a data base allowing comprehensive analysis and evaluations through to obtaining the approval documents circulating for signature.

The solution TESTUS, developed by Berner & Mattner, supports all aspects of test management and test execution of ECUs. It leads through all important process steps: Specification, review, test case approval, test execution and test evaluation.

TESTUS even more efficient with CTE XL Professional

In combination with the classification tree editor CTE XL Professional, TESTUS can support the users in identifying test cases systematically and, with this, efficiently cover the requirements-based test case generation stipulated in the standard.

TESTUS - proven and tested in practice

"In the meantime, TESTUS is integrated into our test and approval processes, assuring high quality of our ECU software", sums up Carsten Rustige, who until recently had been responsible for the software development of the Atego Hybrid and the supervision of TESTUS in the development department of robot-driven gearboxes in the commercial vehicles sector of Daimler. "The users benefit from the practical features supporting them efficiently in all test activities as well as from the good support and the successful development of TESTUS by Berner & Mattner."



Picture: © Christian Lagereek | istockphoto.com



Berner & Mattner is in Charge of Design, Setup and Operation of the HiL Test Bench

Mercedes-Benz Special Trucks – versatile and reliable

As a toy, they make the eyes of the young technophile shine – and, to date, Mercedes-Benz commercial vehicles are the epitome of versatility and reliability. Richard Schwinn at Mercedes-Benz Special Trucks - the official division term for Unimog and Special Vehicles in the Group - explains in an interview how the cooperation with Berner & Mattner has a share in it.



An interview with Richard Schwinn, Team Leader for the development and adaptation of electric equipment / electronics and integration HiL tests of the special vehicle series Econic, Zetros and Unimog at Daimler

Mr. Schwinn, can you please explain the particular quality requirements of your company?

Richard Schwinn: Our vehicles are designed and built for extreme operating conditions and stress. This leads to high expectations regarding our work and our products, such as high delivery quality, reliability and a high customer satisfaction. To ensure this, we use state-of-the-art test procedures.

How is this reflected in the company's organization and testing procedures?

Richard Schwinn: We are a specialized division within the group. The site in Woerth is also separated geographically from the development department in Stuttgart. We make extensive use of components and platforms of the large scale series of Mercedes-Benz trucks and rely on them with our special vehicles. Special components and integration then have to be tested extensively, of course.

As a partner in the HiL area, you have now selected Berner & Mattner. Why?

Richard Schwinn: During the bidding phase, we have evaluated different HiL operation concepts and also examined the technical and economic synergies that are actually available and usable. Company-specific factors have played a role in addition to the long-standing and extensive experience and the reputation of Berner & Mattner in the area of testing, SiL and HiL. Our colleagues in Untertuerkheim have been

working very successfully with Berner & Mattner for many years. We, in turn, also use components and systems from the series trucks - so it seemed logical to use the existing competencies of the same partner. In addition to considering other companies, we have also discussed models such as complete outsourcing or handing over the tests to our truck division. Ultimately, the concept adoption by the truck development in Stuttgart and the partnership with Berner & Mattner presented the largest economic and technical advantages.

What about current implementation and division of responsibilities?

Richard Schwinn: We have found a very good solution with modularHiL. In the first step, we were able to transfer and adapt many of the test cases and scripts of our truck colleagues due to the close networking via Berner & Mattner. While the team of Berner & Mattner is in charge of the operational part of the tests, our experts can fully concentrate on the functional test requirements that make our special trucks unique. In a first stage, the

HiL test stand has already been put into operation with the body systems, and by November, we will cover all the ECUs for three model series, including powertrain. Everything runs according to plan - the idea of increased networking via the joint HiL partner has proved to be very successful. The on-site team of Berner & Mattner fits in very well, both personally and professionally.

Which advantages and benefits do you see now and in the future?

Richard Schwinn: Well, to begin with, there are the general benefits of the component and integration HiL tests. We identify failures and potential weaknesses a lot earlier and can therefore eliminate them with far less costs involved. Due to the high degree of test automation, the high initial quality and reliability of our vehicles can be achieved for a wide range of electric equipment and electronics more efficiently than with manual tests of prototype vehicles. This is obtained, even though the tests on the real vehicle will always be part of our development and assurance processes, in particu-

lar regarding tests with very dynamic and partially still unknown parameters. One advantage of modularHiL is that we can complete and expand the test bench step by step - both in terms of component and integration tests and the range and extension to different series. We learned that we can not only test the existing products with all their functions at the HiL, but also variants that previously have not existed – by connecting and disconnecting functionalities. In this way, we have a kind of virtual prototyping available, which we want to use much more extensively in the future.



So you are satisfied?

Richard Schwinn: Our goal is to assure our future developments and products through cyclic release tests. For this purpose, Berner & Mattner has convincingly creative and constructive solution proposals for the combination of component and integration tests via modularHiL. So far, we are on schedule and our expectations have fully been met. With this way of productive cooperation, we can also benefit from the scale advantages of our truck colleagues in the HiL test. At the same time, we can fully concentrate on what is essential for our markets and expand our know-how for special applications.



AUTOSAR Systems

Quality assurance and architecture evaluation

At Berner & Mattner, we carry out your quality assurance, in particular the architecture evaluation of your embedded systems, including AUTOSAR.

The complexity of today's vehicles has increased dramatically in recent years and will continue to do so due to new functionalities. To ensure constructive quality assurance, it needs to be discussed to which extent new approaches of architecture evaluation can be applied to systems that have been developed in compliance with AUTOSAR.

Architecture evaluation is a promising technique allowing an early assessment of the expected system quality. This already takes place on the basis of a rough system structure, independent of the later implementation.

or modifiability. Based on these results, further analyses investigate the interdependencies of the criteria, the impact of individual attribute changes and their weighting.

Evaluation of the quality attributes

Using an evaluation structure, sub-criteria are prioritized, weighted and then applied to quality attributes. These attributes comprise performance, costs,

Main focus is put on evaluation and comparison of different architectural variants for implementing the overall

functionality in terms of quality. The basic principle is a meaningful combination of appropriate quantitative and qualitative methods. Evaluation techniques such as metrics and simulation results are quantitative methods while interviews with experts are qualitative methods. The evaluation of specific quality attributes of certain system architectures depends on the application context, the use case scenario and others. These factors can vary according to application and environment of the system.

Overall quality

Conclusions in respect to the overall architecture quality can be drawn after finishing the following two steps:

1. Normalization of the individual results, i. e. the classification within the possible universe of results. The normalization is conducted by specifying a quality ratio.
2. Integration of individual criteria: Partial results are integrated by an evaluation structure. With the overall quality being its root, the resulting tree structure thus represents the entire evaluation characteristic for a specific architecture variant.



Picture left: © Dmitry Shironosov | istockphoto.com

Certified Tester Training for success

Certified Testers have an important share in permanently improving and verifying the quality of software products due to their experience and thorough training. Having recognized this, Berner & Mattner integrated the Certified Tester program of the International Software Testing Qualifications Board (ISTQB) into the professional training activities in 2008. Customers thus benefit from the optimal and versatile test know-how of Berner & Mattner's experts.

The ISTQB Certified Tester trainings are aimed at anyone involved in software testing, such as testers, test analysts, test engineers, test consultants, test managers, user acceptance testers and software developers.

The ISTQB certificate for software testers

The ISTQB Certified Tester program is recognized worldwide as a standard qualification scheme for software testing and is applied in more than 40 countries. The syllabus contents are defined by the international organization ISTQB. In Germany, the curriculum and exam questions are issued by the German Testing Board e. V. (GTB) on behalf of the ISTQB.

The training is divided into three levels: Foundation Level

- Fundamentals of Testing
- Testing throughout the Software Life Cycle
- Static and Test Design Techniques

- Test Management and Tool Support for Testing Advanced Level
- Test Manager
- Test Analyst
- Technical Test Analyst Expert Level (in preparation)

Berner & Mattner has been an accredited training provider since 2010

In 2008, the first in-house training for the Certified Tester Foundation Level was held at the site in Stuttgart. After the first 14 Certified Tester training participants, additional 100 experts of Berner & Mattner followed in 2009. In-house trainings have enjoyed popularity at all Berner & Mattner sites. Based

on a permanent innovation process in the field of in-house training activities, individual training concepts have been implemented and different training models have been developed, thus creating more flexible training opportunities.

The in-house success at Berner & Mattner created the basis for meeting the requirements in form and content to obtain the challenging accreditation as an external training provider 'Certified Tester Foundation Level' from the German Testing Board e. V. in 2010.

For more information regarding the CTFL or other Berner & Mattner trainings, training locations and training dates, please visit: www.berner-mattner.com/en/trainings.



Picture: © Andreas Guskos | istockphoto.com
Diagram: © binabina | istockphoto.com

Advanced Driver Assistance Systems as a Challenge

ADAS ensure driver protection - we ensure ADAS

The turnkey ADAS test systems of Berner & Mattner can be used for all radar systems and camera-based ADAS systems and have already proven to be very successful at some OEMs.

Berner & Mattner takes advantage of the wide experience gained in various projects in the area of advanced driver assistance systems (ADAS) at different OEMs and suppliers for setting up ADAS test systems to fulfill today's and, in particular, future ADAS standards. This experience is incorporated into our turnkey ADAS HiL test benches that – already today – are being successfully used at our customers.

Advanced driver assistance systems have found their way into vehicles and are now state of the art. For OEMs they are, amongst others, a means of competitive differentiation, for passengers they mean comfort and first and foremost safety when driving.

HW design / architecture

The ADAS HiL is the basis of a modular test bench setup allowing simulations and test executions in real-time. The interface to the controller is a CAN board. It is used by the FAS HiL to provide the ECU with simulated bus communication of missing ECUs and to input environment simulation data (object interface). CAN signals from the ECU are received at the same time. The object interface can be addressed via an XCP interface when using highly integrated sensors. A relay card and a controllable power supply can provide electrical faults as

well as overvoltage and undervoltage behavior.

The modular ADAS HiL consists of standard components. Customers thus benefit from high setup flexibility and cost savings.

Test environment MESSINA

The software solution for test automation of Berner & Mattner, MESSINA, facilitates the optimal operation of the ADAS HiL. It can provide the ADAS HiL with behavior models in MATLAB/Simulink and other models. MESSINA is also used for the configuration of the simulation as well as the test development and execution. At the same time, results can be recorded and automated and manual tests can be designed and executed.

Further advantages of MESSINA are the easy access to the diagnostics interface and the execution, reading and evaluation of respective diagnostics commands. MESSINA is based on the modern Eclipse Framework and supports the use of open standards.



Hybrid Propulsion System HiL test setup for validation

Testing efforts are enormous both for conventional cars with combustion engines and for electric cars, but the requirements for hybrid drives reach new levels. Manufacturers are facing new challenges in respect to test procedures in the development process of hybrid drives. The combination of two different drive types in a vehicle – electric motor and combustion engine – produces a variety of new operating modes and failure sources that have to be covered by respective tests. Thorough consideration is needed to decide which HiL test setup will ultimately be used.

Berner & Mattner is represented in almost all functional areas of the V-model in the development of hybrid propulsion systems. The projects range from creating requirements via functional safety considerations through to HiL and vehicle tests.

Verification at HiL test systems

Using HiL test systems, Berner & Mattner provides the complete validation of hybrid functions for a premium manufacturer in the Stuttgart area. In addition to process support in the test design of vehicle and test benches, Berner & Mattner is also in charge of planning and executing HiL tests at the specified HiL test setups. The main focus is the qualitative validation of highly integrated drive controls of electric motors for different hybrid vehicle models.

HiL test systems: flexible and cost-efficient

Qualifications of error codes, dynamic driving functions and the communication to the power electronics, for example, are validated via command interfaces using automated regression tests. HiL test systems prove their flexibility also for real-time simulation of failures having occurred in the vehicle.

Only the intelligent cracking of the original E-drive ECU makes a cost-efficient HiL test possible, in particular for

the electronic power ECUs using combinations of small signals and high voltage power components in the same housing. "Cracking" describes the procedure of opening and instrumenting an ECU in order to make the interface between logic and power unit accessible. The output side of the power drivers, carrying high voltage and high currents, can be bypassed because they are contacted at the logic inputs of the power components. High-voltage and current measurement units are stimulated directly by applying appropriately fast environment models. This

manipulation makes no difference for the ECU processor and the software. In this way, almost all test scenarios and interface tests necessary for components and system validation can be run at the HiL. This also allows applying failures safely at the high voltage system for testing the failure qualification and safety mechanisms.

The fast calculation of the engine simulation is a challenge for the setup of dynamic tests close to road reality. Due to the required short cycle times of a few microseconds, it can only be computed separately from the overall model.

Alternative test system with high voltage

An alternative to this way of connecting ECU hardware would be a test system with real high voltages and high currents applied. Advantage: The test would be executed at the end of the interface chain - directly at the terminals of the electric motor. Tests of internal function groups for early fault detection during the development phase, however, would then be neglected. For realistic operation of the power electro-

tics, this test system would need to provide appropriate power in the range of 2 or 3 digits kW and a very powerful cooling system. The simulation model would be affected here only by a shifted interface in a way that the control of the power transistors is now taken over by the ECU itself and the real currents and voltages are transferred to a simulated high power load. An ambitious simulation of the electric motor would still be necessary. Due to the significantly higher risk potential, a complex safety chain needs to be implemented when testing an actively liquid-cooled ECU with real high voltage and high currents.

Conclusion

The decision on how to regard a test system setup ultimately depends on the test focus. In both cases, however, the environment modeling accuracy is the limiting factor. The more detailed the structure or the closer the HiL system comes to the real vehicle function, the higher are the requirements for the model accuracy and the very fast I/O hardware for signal acquisition and reverse feeding.



News Headlines

>> Technical paper 'Test Management for Powertrains in Commercial Vehicles with TESTUS'

Together with the powertrain division of the commercial vehicles sector of Daimler, Berner & Mattner has developed a tool suite to support the test process. Article: www.berner-mattner.com/press

>> Strengthened sales team:

For the expansion of the Ingolstadt site, Berner & Mattner has managed to get Dipl.-Ing. Hermann Senninger on board as Senior Account Manager Automotive. The 49-year-old is an experienced expert and will mainly be responsible for the Audi account.

>> ADAS test benches in demand

An OEM orders two more ADAS test benches after the successful set-up and operation of a HiL test bench for camera tests.

>> Meet Berner & Mattner

Berner & Mattner will present its services at the conference 'Fortschritte in der Automobil-Elektronik' in Ludwigsburg from June 7 to 8. Visit us. Information: www.elektronik-tagung.de

>> News from the product corner

The new versions MESSINA 3.1, CTE XL Professional 2.1 and MODENA 5.1 are available as of now. See page 15 for more information.

>> ISO certification renewed:

The ISO/IEC 9001:2008 certification was renewed and the continuation of the ISO 27001:2005 certificate was confirmed by DQS in April 2011.

>> Presentation at 'MBTconf 2011'

Berner & Mattner will give a lecture on the topic 'Consistent model-based testing of reactive systems' in Munich on June 29, 2011. Information: www.bmtconf.de.

For more details on these topics please visit: www.berner-mattner.com/en/newsticker-automotive

Verified Diagnostics Tools

Verifying a VCI interface

Not only the complexity of electronic systems in the vehicle is increasing, but also the complexity of diagnostics tools used for systems in development, production and garages. Therefore, structured validation of the diagnostics tool chain is becoming more and more important. Ensuring high software quality is thus essential right from the beginning. The later an error is detected, the higher the costs to correct it. Berner & Mattner significantly helps meeting budget and schedule plans.

Structured validation saves time and money

More complex electronic systems in the field of diagnostics lead to new challenges for verifying these systems and components. The requirements for the diagnostics tools' functionality are getting more and more complex, such as flashing ECUs via a network or new communication protocols. Due to the complex dependencies, the testing effort for new diagnostics tools is rising disproportionately, resulting in higher costs and extended test periods.

A structured validation planning works against this trend. The aim is to achieve maximum test depth with an optimal

process and an ideal selection of test cases. Test costs thus remain within reasonable limits, scheduled goals are achieved and the validation quality of the diagnostics tools increases significantly. Failures have to be found in the initial phase of the project. The longer an error remains in the device, the more complex and costly its remedy gets.

Accomplishments of Berner & Mattner

Berner & Mattner supports in verifying new diagnostics VCI interfaces. On the one hand, this includes raising the project environment awareness towards a structured approach of testing. On

Berner & Mattner is the first point of contact regarding the validation of diagnostics components at Daimler. In addition, Berner & Mattner develops software components for new diagnostics technologies such as DoIP and D-PDU-API according to ISO 22900.

the other hand, it includes the structured planning of validation activities for the diagnostics VCI by means of the V-model and according to IEEE 829. Here, a certain number of test cases is selected methodically out of an infinite number of possible test cases. With the help of this selection, the desired test coverage can be achieved taking into account cost, time and quality.

The tests are executed by means of a release plan. The test results are documented, reported and, based on tools, coordinated with all stakeholders. All activities are conducted by qualified and accredited "Certified Testers".

Benefit for the customer

Berner & Mattner covers the integrated test activities in accordance with IEEE 829 – throughout the whole development process, including planning, test organization and test execution. The customer can fully concentrate on the development of diagnostics components. The risk of finding serious errors too late, for example just before the start of series production, is significantly reduced. The high validation quality thus leads to a significant cost reduction and high customer satisfaction.

Opportunities for Graduates

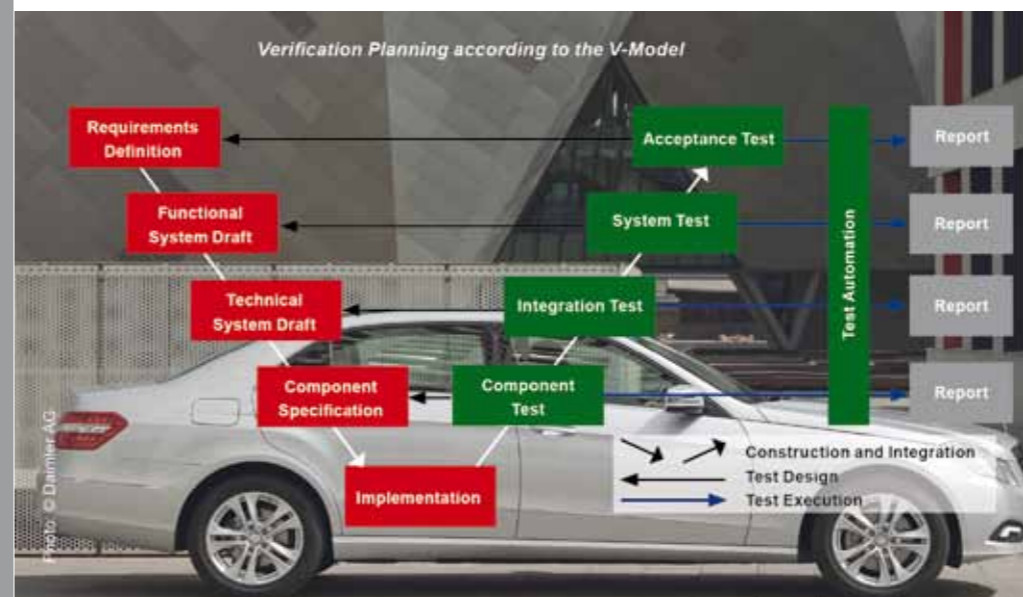
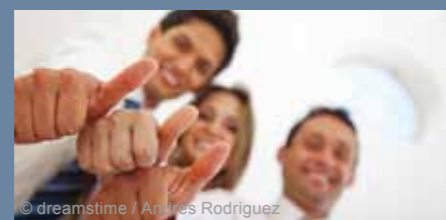
Our intersite trainee program is tailored to graduates and engineers with first work experience. It offers the opportunity to acquire practical experience.

Information: www.berner-mattner.com/trainee



In addition to that, we offer interesting internships, jobs for working students or the opportunity to write your graduation paper (Bachelor, Master, Diploma).

Information: www.berner-mattner.com/jobs





International Growth

Berner & Mattner joins international Assystem Group

Berner & Mattner has been part of the international Assystem Group since February 4, 2011 - but will continue operating as an independent company. Continuity is paramount, ranging from staff to management. Taking this step, Berner & Mattner has laid the foundation for an intensified international engagement as well as a significantly extended service portfolio.

The integration into the Assystem Group offers our customers on the one hand, maximum continuity, on the other hand access to an extended service portfolio such as mechanical construction, overall development of mechatronics solutions or test solutions, in particular in the area of hybrid and E-drives. The Assystem sites for instance in Romania also allow us to integrate flexible offshoring services into our projects to the benefit of our customers.

With more than 8,500 employees worldwide – 1,100 in Germany alone – we are able to assume responsibility for considerably larger work packages than in the past, combined with a significantly improved reaction time and, if needed, larger project teams.

The sales network of the Assystem Group opens additional markets for our services to OEMs and suppliers outside of Germany. This not only boosts continued, above-average growth of Berner & Mattner. It also enables us to increasingly support international cooperative projects of our automotive customers by providing development and consulting services in a more tightly focused and intensive way.

Berner & Mattner's entire team remains on board without any changes in order to successfully continue running the business and to contribute to the expansion of the Assystem Group in Germany.



Hans Berner, CEO Berner & Mattner (l.),
Dominique Louis, CEO of the Assystem Group (r.)

"We look forward to joining Assystem and giving a new dimension to the company. With the growth prospects in embedded systems in Germany and worldwide, I believe it is the right time to benefit from the size and reputation of an international company," comments Hans Berner.

Benefits:

- Maximum continuity
- Extended development services
- Integration of flexible offshoring services
- Acceptance of considerably larger work packages
- Supporting our customers in international cooperative projects

News from the Product Corner

MESSINA 3.1

The addition of a Windows target now also facilitates model execution and functional testing in Windows. The new runtime system provides ease of installation and usage of the SiL environment. An outstanding feature is the ability to execute test cases created in Windows directly in the HiL system under real-time conditions.

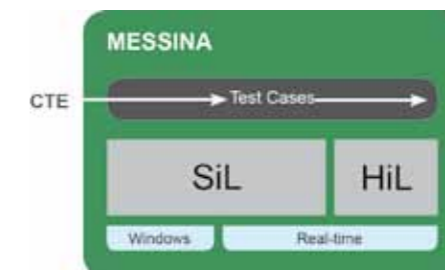
Another highly useful feature is the AUTOSAR test RTE. For this purpose, a powerful RTE code generator has been integrated based on Artop. The automatic generation of the RTE is thus possible as well as the execution of "runnables" in Windows on the basis of AR.XML design description. In addition, all AUTOSAR port types are accessible from the test case perspective, making it possible to perform AUTOSAR tests without target hardware and with significantly shorter turn-around times and improved test quality.

New: Webshop

The CTE XL Professional will be available directly from our webshop on our website as of June, 2011. The shop includes common license types and 2 support packages.

CTE XL Professional 2.1

The most important extension of version 2.1 is the ability to assign weightings. This function generates test cases automatically and in prioritized order. The resulting test suite can be optimized afterwards by specifying the desired test coverage and by adjusting the degree of coverage. Another innovation is the improved interface to the requirement tool DOORS. Due to the requirement tracing feature, each specification change in DOORS is automatically detected and transferred to the test cases to be reviewed.



MODENA 5.1

The new MODENA version 5.1 includes some helpful new features. Amongst others, the functionality "stress feature", provided by the hardware interface has been included. The stress features Light, Lock, Bus Load and Receive Buffer can fully be applied. The new version also supports the MOST High Protocol in accordance with MOST High Protocol Specification 2.3.



Juergen Meyer, Head of Automotive Division at Berner & Mattner:

"Based on our long-term test experience, we have been improving our software continuously in order to reduce the configuration effort and to make testing during the development process easier for AUTOSAR developers in Windows. We are confident that AUTOSAR tests will further be improved in quality and will significantly be accelerated by using the new versions of MESSINA and CTE XL Professional."



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November 2010

- >> Diagnostics - One main emphasis in Ingolstadt
- >> MERAN - Intelligent specifications and optimized test management
- >> AUTOSAR Software Components - Verification with a test RTE



March 2010

- >> Virtual Integration - Validation with AUTOSAR
- >> Telematic Functions - Faster Development using MODENA
- >> Advanced Driver Assistance Systems - Early Lab Tests



September 2009 (German only)

- >> MESSINA 2.0 - Benefit for ECU Function Developers
- >> Systematic Testing - Streamlining Processes with Innovative Methods
- >> SW-Quality Assurance - Using Statistical Code Analysis

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