



# Precise and Reliable Measurement Technology Beyond the Decimal Point

#### **COVER STORY**

"We gain a lot of efficiency through strong customer loyalty" MCD ELEKTRONIK "Shaping the future instead of following trends"



# The industry faces challenges

#### Dear Reader,

Digitalization has a firm grip on the automotive industry. In many aspects, it finds itself in a process of rapid transformation. This process is being driven by an all-encompassing application of connected systems, which is essential for automated driving functions. Furthermore, the electrification of the powertrain and the desire to integrate state-of-the-art consumer electronics into the vehicle require a huge amount of effort. In the wake of this very dynamic process of change, great demands are also being placed on future testing methods and systems. This is discussed by Bruno Hörter, CEO of MCD Elektronik, in our AT-Zelektronik interview [in the Special Issue for Electronica 2016].

Hörter points out, that testers today not only need to be highly scalable and configurable but he believes that more and more special and combined solutions are required. These include not only testing, but also the assembly process and other stages in the manufacturing of the product. After all, in fast-moving development processes, increasing numbers of applications are already being used in the qualification phase. Fears that a faulty component in a partially or highly automated vehicle might result in an accident put huge pressure on developers.

As a specialist for mechatronic and fully automated test systems, MCD sees systems for testing electronic components at a very early stage as a possibility for test under extreme conditions. For example, this might include the effects of high temperatures, severe dirt contamination or high levels of mechanical stress. As further developments in multimedia systems also mean that curved displays, headup displays and complex augmented reality representations are being introduced into the car, the industry must consider the issue of sensors for optimum image recognition, including the data processing involved.

This opens up a broad spectrum of tests and system optimizations that still need to be developed. For instance, tests of fully graphical displays are among the most innovative tests that MCD performs, not only by using high-resolution cameras but in the meantime also by using robot technology. However, the industry is facing an even greater challenge. The trend towards fully connected vehicles means that it must also address issues of data security and possible hacker attacks.

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# "We gain a lot of efficiency through strong customer loyalty"

Bruno Hörter, CEO of MCD Elektronik, and his workforce of just 80 employees supply test systems for electronic components, assemblies and mechatronic units to 45 countries. His company initially performs the test in its own laboratory and then applies the knowledge gained to the development phases of a car. ATZelektronik spoke to the founder of the company about the challenges resulting from digitalization.

**Bruno Hörter** was born in 1958 and began his career by training as a radio electronics engineer and certified engineer in the field of data processing technology. He began his professional career at Becker Autoradio (now Harman International), where he worked in the fields of test system development and software programming. Among other things, his development of an attenuator box for the adjustment of output levels for RF transmitters led to the launch of the company MC Elektronik in 1983 (1984 MCD Elektronik GmbH), alongside which Hörter founded other companies in parallel as a managing partner. These included MCF Technologie GmbH, which supplies test systems and test adapters for manufacturing, development and laboratories, as well as two other companies that produce and commercially distribute circuit boards and assemblies.

ATZelektronik Bruno Hörter, in many respects, the automotive industry is going through a fast-moving process of transformation. This follows the trends relating to connected vehicles on the way towards automated driving functions, as well as the integration of consumer electronics into the vehicle and the electrification of the powertrain. What impact is this having on your testing methods and equipment? **HÖRTER** It is certainly true that we are being confronted with many different and new challenges in a very dynamic process of change, both financially and with regard to the requirements placed on our workforce and technology development. In the field of high-voltage safety in particular, these are huge challenges that require a steep learning curve not only for our customers but also for us. As connected driver assistance systems become increasingly complex, resulting in increasingly large quantities of data, we have developed in-house IT and software solutions, although this is actually a discipline that we offered right from the start.

#### With all of this standardization taking place, is there nevertheless a trend towards more individual tests?

It is only at first glance that our stan-

dard testers give the impression of a continuously recurring methodology. They are, however, highly scalable and configurable, which means that they are still suitable for very many applications even today. However, more and more special and combined solutions are required, and these include not only testing but also the assembly process and other stages in the manufacturing of the product. In the fast-moving development processes that we are now seeing, we are required to deal with more and more applications even in the qualification phase. These include haptic 85 % of our revenue comes from our project business and 15 % is generated from our hardware and software products. At the moment, 80 % of our products are exported and we deliver to more than 45 countries.

### How can you achieve that with 80 employees?

A lot of efficiency lies in customer loyalty. Our customers have a very high level of training and the use of standards helps them to quickly find their way even around the most diverse systems. There are very many systems

# "85 % of our revenue comes from project business, 15 % from hardware and software"

tests at extreme temperatures, the simulation of sensors and elements that do not yet exist, and so on. For these purposes, MCD has a development team for hardware and software that can respond rapidly to these special requirements.

### What is the current business situation at MCD?



"The most innovative tests include those of full graphic displays, which in the meantime we are testing using robot technology," said Bruno Hörter, CEO of MCD Elektronik, in an interview with Markus Schöttle, ATZelektronik

that are expanded by our customers completely by themselves. Most service cases are also dealt with by our customers' service departments. In these cases, we provide support with remote access. After the final inspection at our company takes place, many of our systems are put into operation by the customers themselves. Our employees also come from many different countries and not only understand the customers in their native language but are also familiar with their mentalities and their expectations. In Hungary and China, we have direct contact partners who carry out calibration and service on site. In addition to efficiency in cooperation, there are also technical levers that we can apply. For example, we were able to implement starter motor cooling solutions for automatic start-stop systems in modern vehicles that we had already used in a similar form for commercial applications. A process of readjustment and optimization was necessary, but in the end we were able to present a solution that can also be used as the standard for this sensitive area in the future.

### Which partners do you work together with and how are the roles divided up?

We have founded a separate company in the mechanics segment and for construction and wiring, and in the meantime this company is operating very successfully and is completely independent from MCD. By setting up this company, we also wanted to secure the



"Our future workshops made it clear to everyone that they need to take a break from everyday business in order to allow visionary thoughts to emerge. I would like to create this free space," explained Hörter.

dependence of key suppliers and to give our customers additional security. We have other strong partners in the fields of design, mechanical production, construction of systems, control cabinets, in-line components and manufacturing.

#### 18 months ago, the semiconductor industry warned that the functional safety of safety-critical functions in the vehicle can no longer be guaranteed in some cases. Some electronic components should be declared as wearing parts.

I heard about that. This is not a new topic in my opinion. Of course, there will always be cases that have not been considered or which are so unrealistic that they were overlooked. However, if the problem is known, we need to find solutions that guarantee secure operation, and if necessary such functions must have multiple redundancies and be failsafe.

#### When it comes to partially and highly automated driving, we cannot afford to let anything go wrong, and accidents would upset the long-term plans of the automotive industry.

This is a very sensitive issue. The automotive industry would like to offer automated driving and every car maker wants to be the first to impress its customers with new functions. This creates enormous pressure for everyone to get their products ready as quickly as possible. We cannot rule out the fact that mistakes might occur. In our sector, we notice that there is a degree of insecurity and, of course, fear is also playing its part. We are developing more and more devices for testing such components at a very early stage for situations such as temperature, dirt, stress loads, operating states, bus communication and mechanical influences.

### "Creating free space for more creativity"

How is it possible at all to present individual solutions at a trade fair stand like yours at Electronica? What are you focusing on at Electronica 2016?

We will be presenting combined solutions. From the problem to the solution. Our solutions might include functional tests with boundary scan applications supported by camera-based evaluation and multi-functional robot-assisted testers as well as special developments and machines for special tests such as haptic measurements and the evaluation of buttons. We are presenting our solutions under the motto "Sharp Senses for Perfection".

# Which tests include a particularly high level of state-of-the-art MCD know-how?

For example in the testing of full graphic displays which are now switchable and adaptable by the user. We test these displays not only by using high-resolution cameras but also in the meantime by using robot technology. This enables us to make our tests faster, more standardized and cheaper. What is more, it allows us to keep pace with the rapid speed of consumer electronics innovations, for example in the case of curved displays, which we can scan very precisely. It is important to develop even more expertise in head-up displays and complex augmented reality projections. In these cases, the robot replaces the driver, who must be able to safely recognize the projections from different perspectives. One of our main jobs is programming, which includes connectivity with driver assistance systems and also with vehicle dynamics systems.

#### Does this mean, therefore, that you have to be involved at an earlier stage than before in the car maker's development process?

We generally have to do that, yes. The message cannot be sent often enough. However, with regard to the type of system-wide interactive networking that I described above, it is absolutely essential.

#### Do you also perform tests in the vehicle?

Our tests take place in the laboratory. In the course of the vehicle development process, we then also supply the measuring equipment that our customers use in the real vehicle.

### In which other areas does MCD need to further expand its expertise?

We need to address the issue of data security and possible attacks by hackers. But what occupies us very intensively in the wake of digitalization is the issue of sensors for optimum image recognition, including data processing. Pedestrian recognition, for example, is no longer unknown territory, but it nevertheless opens up a broad spectrum of tests that still need to be developed and system optimization. The sensors must be exposed to leak testing and pressure balance testing under severe external conditions and with a high level of dirt contamination. Cameras are still very light-sensitive. In such cases, our test results can provide valuable feedback

into product development and simulation at the customer.

## That must mean that you already have some insight into the next generations of technology, for example in camera systems and image processing ...

... and unfortunately I am not allowed to reveal them to you at the moment. Nevertheless, some theories are not a secret. For example, with regard to the light sensitivity issue I just mentioned, we and our customers are working on focused high-level light intensities that can be masked in a targeted manner to prevent them from being considered by the control system. But this is a long way from practical implementation, as the possible positioning and production feasibility of the camera chip and the real-time processing of the data quantities are still far away from series production capability. It is exciting to see how companies are working intensively on very different solutions.

Is it even possible to pursue such far-reaching and in some cases visionary development targets in parallel to your everyday business? Not in the depth and quality that we strive to achieve. It is true that we generally work together with young companies and institutes that are full of good ideas to make sure that we do not miss any trends. But we intend to further expand these creative processes with the project "MCD Vision 2026". To secure the future of the company, we have a workshop programme that will ensure that the management level is ideally prepared for the future. But in these future workshops, everyone was also aware that one has to take a step outside everyday business in order to allow visionary ideas to develop. I would like to create the free space to do this.

Bruno Hörter, thank you very much for this interesting interview.

**INTERVIEW:** Markus Schöttle

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# "Shaping the future instead of following trends"



Visionary ideas and precise, reliable measuring technology ensure that MCD provides an optimum service even in the finest details.

**MCD Elektronik** is one of the leading companies in the development and production of measurement devices and test systems for electronic manufacturing. Its mechatronic and fully automated test systems consist of complex, modular hardware and software for use in almost all areas of quality assurance in which usability and profitability are decisive factors. For its customers – OEMs from the automotive sector, as well as companies specialised in mechanical and plant engineering, medical technology, defence and safety technology, quality engineering, sensor manufacturing and aircraft engineering – MCD combines the fields of research and development, sales, production and service to deliver customer-specific test solutions. MCD Elektronik GmbH was formed in 1983 and now has 80 employees. The privately held, owner-managed company has offices in Germany, Hungary and China and supplies its products and services to more than 45 countries worldwide. To ensure that it remains globally competitive with cost-effective production in spite of pressure on prices, the company is committed to a consistent policy of zero tolerance with regard to quality assurance.