measX
Measurement System Experts

Efficient Analysis
and Report Creation

Test Data Management and Analysis Systems

Overcoming Challenges
and Maximizing Opportunities
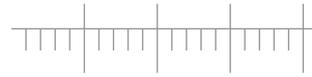
The testing of materials, parts and components plays a key role in modern product development. It drives goal-oriented research and lays the foundation for far-reaching decisions. Efficient and reliable test data analysis therefore represents a major competitive advantage.

Continuous progress in measurement, automation and computer technology has resulted in ever-increasing testing requirements: more measurements are being taken and with greater precision than ever before. Technical data from a variety of sources and different formats must be reproducibly analyzed and evaluated. The entire process, from data acquisition to data storage, analysis and reporting, is becoming increasingly complex. Moreover, work is often distributed among various locations, meaning that information must be made available across multiple teams and departments.

To reliably maintain a proper perspective and access meaningful information quickly, professional and structured processes are indispensable. This is particularly true of large testing facilities but also pays off in smaller testing environments by keeping them open to future expansion.

From data acquisition, structuring and storage to analysis and reporting, we supply a complete solution for your test data management.

Data source

Roller test benches

Motor test benches

Component test bay

Mobile tests / loggers

Old data, etc.

Data storage

Data transfer and data preparation

Database

Data selection

Archive

Export

TDM ATF DMP ZIP . . .
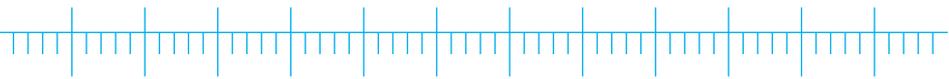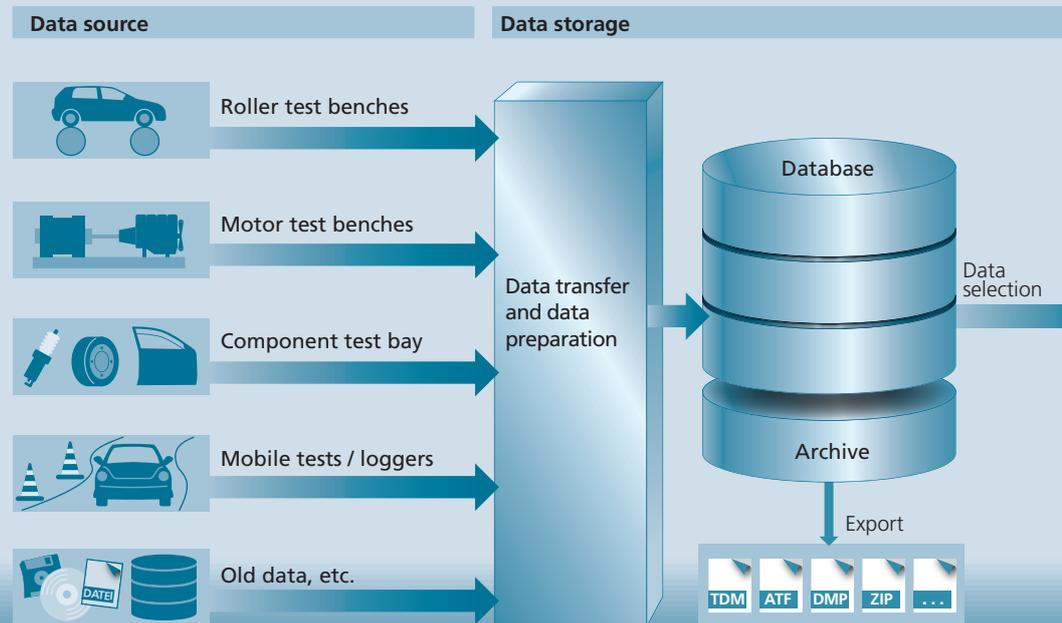
TDM systems from measX are used successfully across a wide range of industries.

Vehicle tests
Motor and roller test benches
Component tests
Device tests
Vehicle safety tests
**Statistical monitoring**

Our Solution for Your Test Data Management

Renowned customers in the automotive industry and other industries utilize the knowledge and extensive experience of measX to continuously optimize their test data analysis. Our consulting and service competence ranges from detailed system and requirements analysis to the realization of complete test data management systems in any IT environment – with strict data organization and convenient analysis tools.

As experts, we always keep an eye on the entire process – from the generation of the test data on the test bench all the way to the finished analysis report. Structured project management and a cooperative approach are additional keys to our success. We work closely with you to learn your goals, environment and style of work. You profit not only from IT competence but from the broad-based engineering expertise of our software developers.

Small and Large Solutions
Whether you need special analyses, seek to automate your data analysis or would like to realize an analysis system for a large testing facility – our developers approach your special application with an acute sensitivity to all aspects of the problem and a pronounced sense of responsibility. You receive a mature solution that will enable you to maintain an overview, avoid unnecessary test duplication and save time for critical, revealing analyses.

Analysis

Report
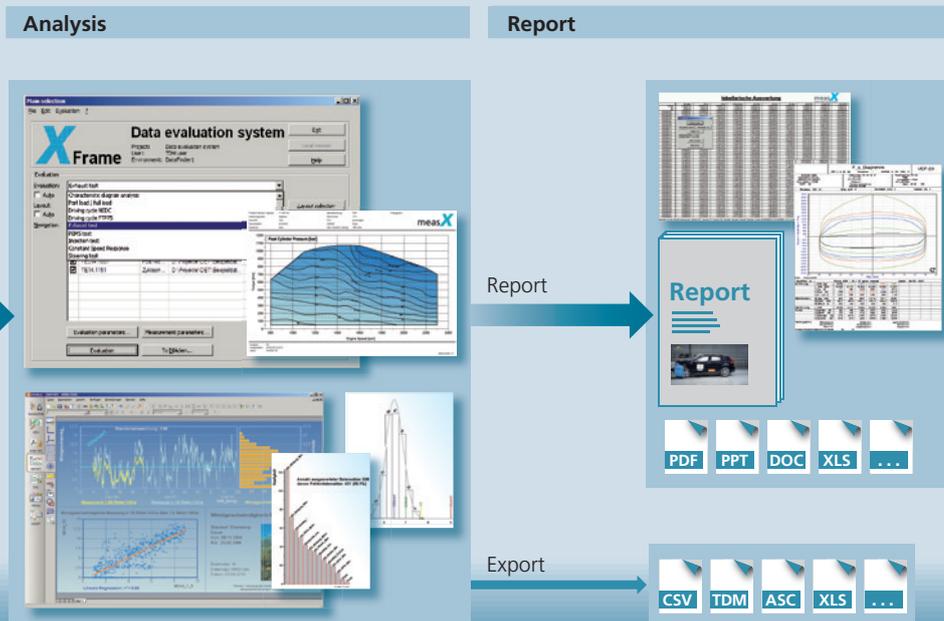
Optimized data structures and requirement-oriented analyses offer you more:

x **Information**
x **Reliability**
x **Flexibility**
x **Efficiency**
x **Sustainability**

Report

Report

PDF PPT DOC XLS . . .

Export

CSV TDM ASC XLS . . .

From single workstation solutions to applications with hundreds of users – measX supports you with services and consulting tailored to your needs.

x Consulting
x System analysis
x Data management
x Database design

x Software development
x Analysis systems
x System maintenance
x Training

Optimal Management and Efficient Use of Test Data
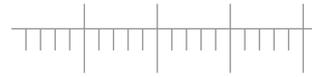
Uniform data organization and central storage are core aspects of our TDM solutions. The more complete and well-structured the measurement and test data is from the very start, the faster and more reliable the resulting analyses and con-clusions are. In practice, tremendous im-provement potential exists here: Key test data may be difficult to locate or cannot be properly categorized. Test data may be structured in different ways and can only be compared after extensive preparation and conversion processes. We support you in bringing order to your data.

**Individual Survey of Current Conditions**
It all starts with a detailed survey of the current situation. We shadow you in your daily work and familiarize ourselves with your tasks and procedures. We discern problems and identify relevant inter-faces to other systems. On this basis, we develop and discuss with you possible improvement concepts. At the same time, we never neglect the requirements on the analysis side as well as the demands of the test bench technology and IT systems. Other factors of the implementation, such as time, costs and depth of innovation,

naturally also enter into the process of solution development. In the end, you have a thoroughly structured data management concept tailored to your needs – as the basis for successful analysis processes, flawless information exchange within your team and much more.

Data Organization from Concept to Realization:

Based on the system and requirements analysis, we develop a strict concept for structuring your data.

We build your data structures according to your precise needs during the detailed implementation process.

Data source | Data storage

Roller test benches
Motor test benches
Component test bay
Mobile tests / loggers
Old data, etc.
DATEI

Data transfer and data preparation

Database
Data selection
Archive
Export
TDM | ATF | DMP | ZIP | . . .
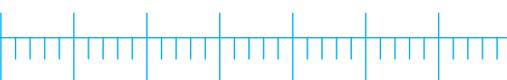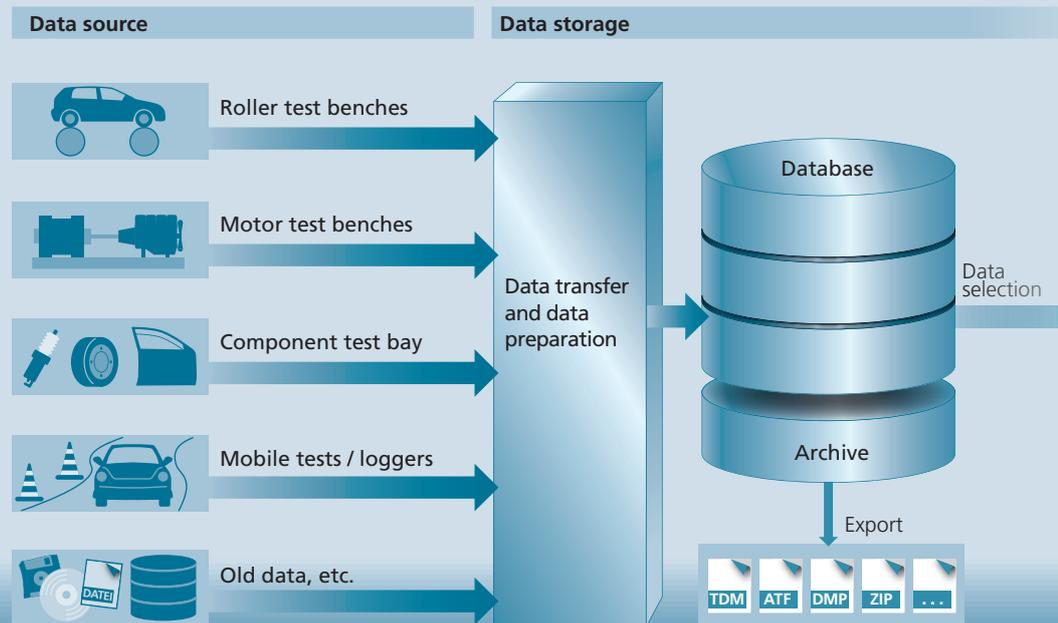
With a structured organization,
you get more from your data
in terms of:

Availability
Discoverability
Transparency
Comparability
Exchangeability

ASAM
M E M B E R

ORACLE Gold Partner

Uniform Storage in a File System or Database

Data storage is the link between data acquisition, data analysis and all other involved applications and components. We carefully weigh the advantages and disadvantages of various technologies to find the best solution for your system. If desired, we can also take into account the requirements of the ASAM ODS standard. Depending on the project size and specific requirements, we will recommend to you a file server or database. If necessary, we will configure a complete database, assist you in integrating it into your IT environment and take over responsibility for ongoing operation and management.

The Right Data at Your Fingertips
Our data management concepts ensure that important metadata is available alongside the test data itself. For example, such metadata could describe which specimen was tested as well as its specific features. Relevant test bench configurations are also recorded. Thanks to this supplemental information, you can always uniquely identify the collected test data. We work with you to develop guidelines for labeling the test data and using the supplemental information in ways that conform to the dynamic reality of your measurement environment.

Masterful Control of the Data Flow
We work to guarantee the necessary infrastructure for all aspects of your data. Modules developed specifically for your applications optimize the transfer and preparation of data in your system. The options are nearly unlimited here. For example, your data can be inspected directly upon acquisition with logging of interesting data sets. Or special preliminary analyses and the calculation of key values can be routinely performed as preparation for more detailed analysis. Receiving technical data from a variety of sources also poses no problem. The data is structured uniformly and automatically synchronized at the same time. Naturally, you can also export your data in any new formats and individually archive it according to defined criteria.

Convenient search and simple navigation of your data.

Structured Measurement Analysis for Secure Decisions
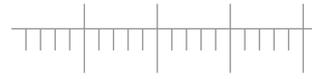
Our analysis systems are the answer to the constantly expanding requirements of test data analysis. It is routinely necessary to draw relationships between changing parameters and other values as quickly as possible. A collection of individual "home-spun" solutions is not a viable long-term answer. Relying instead on a universal but flexibly extensible analysis system supports transparency and takes advantage of synergies. Especially when information must be exchanged between different teams and departments, uniform standards are essential for efficient processes and reliable results.

Whether you wish to automate recurring daily tasks or to constantly view your data from new perspectives, we will develop for you a coherent analysis system that fits into your IT environment and lives up to your specific needs. We not only consider the data sources, desired analyses, forms and reports but also the user interface and data navigation. You determine the development depth, up to and including turnkey applications with completely implemented analyses.

Systematic Analysis

One key advantage of our analysis systems lies in their ability to significantly reduce the complexity of test data analysis. All analysis tasks are systematically structured and associated with overarching analysis types that form the foundation for numerous automated functions as central sorting and organizing criteria. We work with you to develop the technical and content-specific criteria for defining the analysis types used within your system.


User-Friendly and Intuitive Operation

Selecting data and analysis types, defining layouts, configuring specific parameters and starting analyses – users are guided step by step through the process of test data analysis. Every sub-step can be accessed at any time to modify inputs. The user interface is individually adapted to your work process by our developers.

Our TDM systems can even be configured to automatically assign an analysis type and appropriate layout based on the data type. This takes you quickly and reproducibly to the desired results.
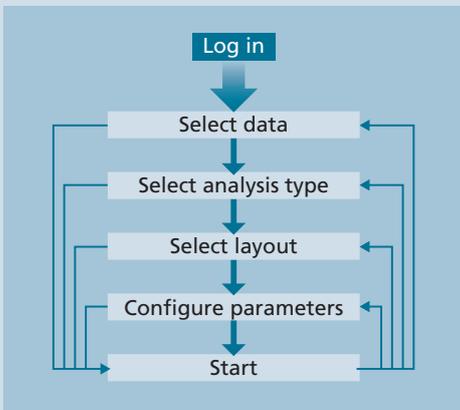
The tasks are structured by analysis types.
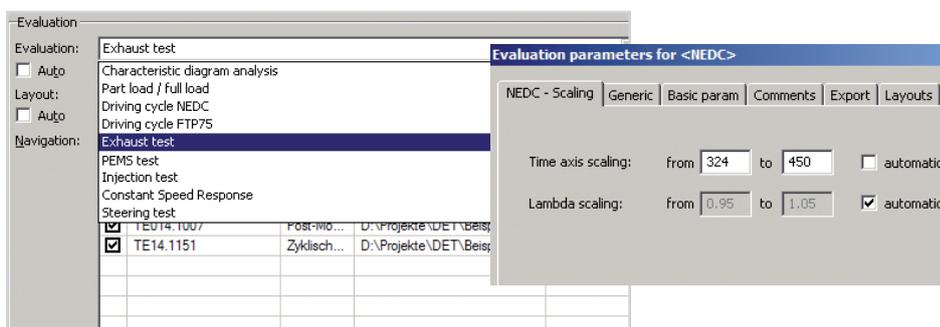
Reports Suited to Your Needs

Informative diagrams and tables assist your decision-making process. Users appreciate that our analysis systems allow them to focus on their core tasks. There is no need to create complex macros and scripts to implement the desired algorithms. By defining the layout of your reports and parameterizing the formulas, you determine how the measurement data will be processed mathematically. The descriptive information pertaining to the data is automatically included in your reports.

The finished analyses can be assembled into a report (e.g. as a PowerPoint or Word document) and individually edited later.

Open to All Sides

You can export all data, raw or processed, in diverse formats for further processing in a simulation system or for direct transfer to the machine control. Uploaded to an Internet server or your cloud, you will permanently have access to analysis results and reports from anywhere.

Analysis	Report

Report

Report

Export

PDF PPT DOC XLS . . .

CSV TDM ASC XLS . . .
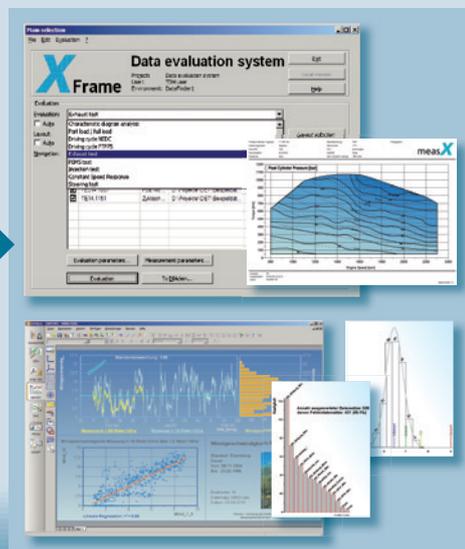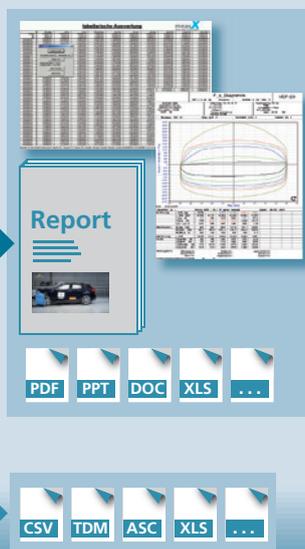
Powerful Tools

We primarily use our proven software platform X-Frame. However, depending on the project requirements, we also use tools from other manufacturers such as DIAdem, UniPlot or Excel and create individual programs with Python, C#, Visual Basic and other languages.

The Benefits of Our Analysis Systems:
x Maximum transparency via uniform structuring
x Extensive flexibility with easily adaptable functions
x Security and efficiency thanks to a high level of automation
x High-quality results based on reproducible analyses
x Massive scalability

# Create Your Own Analyses Faster with X-Frame
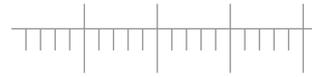
In order that you can optimally complete your challenging tasks, the analysis system must be customized precisely to your needs. However, we developed X-Frame in order to keep the amount of customer-specific programming to a minimum during application development.

X-Frame already includes all the basic functionality of an analysis system. Common requirements, such as the analysis algorithms, dialogs and user interface as well as program control, have already been implemented and need only be adapted to the customer's needs. In addition to these fundamental elements, X-Frame also offers many modular extensions. If necessary, you can individually modify or entirely replace all modules and functions; the software is also open for any other applications.

You profit from the large X-Frame user base and our continued in-house development work. Functions and components that have proven themselves in other projects are integrated into the base software package. Holders of the measX maintenance contract receive regular updates for their software package.
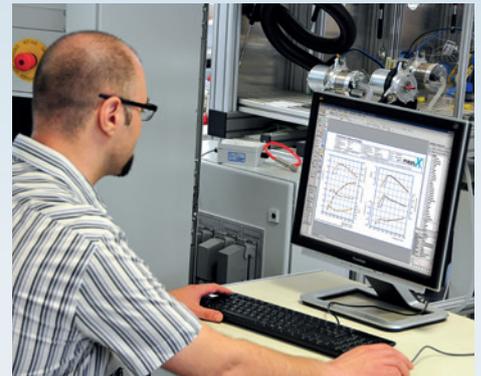
At Home with All Data Sources
Whether you manage your data in a database or store it in a file system, the special driver concept of X-Frame supports all typical data formats. Because data from different data sources are handled equivalently, you can carry out comparative analyses very easily and quickly. All data can be located quickly with the integrated X-Frame data navigator and data selector module.

Custom formulas even for complex calculations.

Examples of the many possible X-Frame applications:
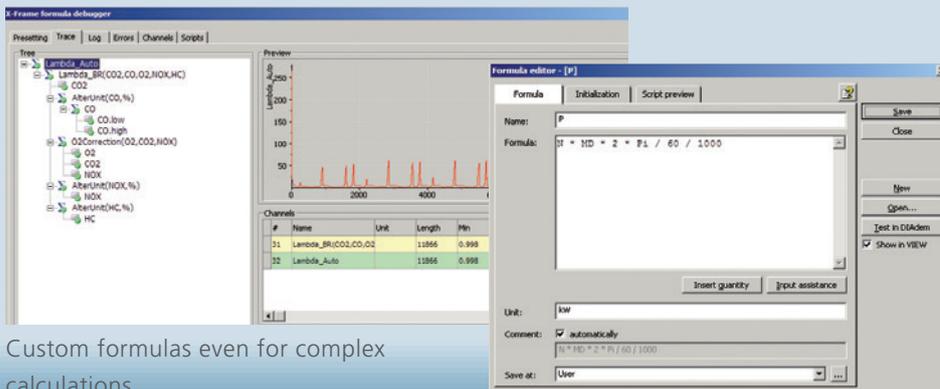
Component test bay with 180 users
Shock absorber test bench with 5 users
Test center with 60 motor test benches and 200 users
Road endurance testing for 40 utility vehicles with 50 users
Steering test bench with 10 users
30 laboratory test benches with 70 users

Parameterizing over Programming

X-Frame supplies a foundation of core functions and a comprehensive formula library. You can perform many analyses purely on this basis without the need for any programming of your own. You design your layout by assembling the desired display elements, including variables and formulas, via drag-and-drop. You can modularly create your own formulas and combine them into complete calculations. You are supported in this by a formula editor and an integrated formula debugger.

Simple parameter assignment allows you to define your formulas in extremely universal ways and avoid unnecessary redundancies. Standardized parts of X-Frame are already documented in detail, and you can integrate individual portions into your online help on a project-specific basis.

User Management Included

Integrated user management proves itself especially useful on systems with many users. Every user has a separate work environment in which parameters and configurations can be individually managed. Alongside the centrally available analyses, you can create special layouts or formulas for yourself or your group. Specific analyses or entire project areas can be shown or hidden for defined user groups to free users from distracting and unnecessary interfaces. Integration into the network user management (LDAP/ domain) is also possible.

The Most Efficient Solution for Your Analysis Tasks

Individual analysis solution with extensive programming effort

Customer-specific adaptation

Report generator
Formula library
Core analysis functions
User interface
Data management
Program control
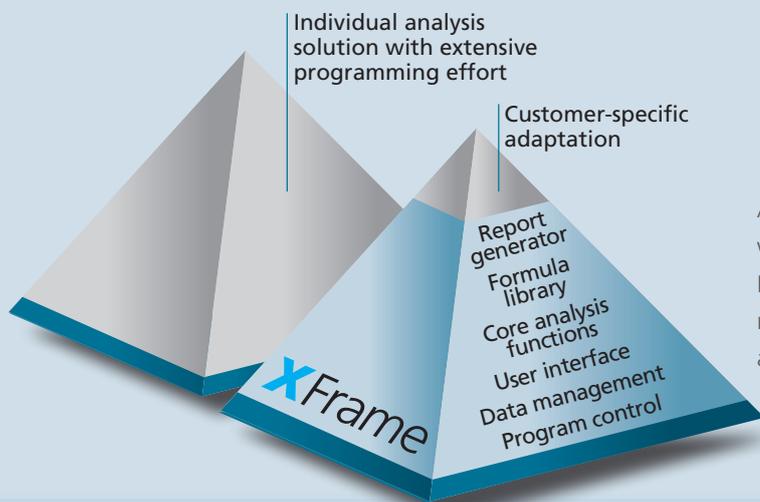
xFrame

Analysis solution with **X-Frame.** Many basic requirements are already met.

X-Frame Offers Special Functionality:

- x User management
- x Formula wizard and formula debugger
- x Unit conversion
- x Characteristic diagram analysis
- x Data synchronization
- x Automated analysis
- x Comparative analysis
- x Analysis of sections
- x Individual saving of all settings
- x ActiveX interface

Your Advantages:
- x Faster application development
- x Convenient operation
- x Simple extensibility
- x Broad application spectrum
- x Less time required for training and system operation
- x High reliability thanks to broad user base
- x Future-safety through continuing development

Turnkey for Vehicle Safety

X-Frame is the platform we use most often for our customers' evaluation systems. Also our own evaluation solutions for vehicle safety, X-Crash and X-Zero, are based on X-Frame and use the openness and flexibility of the evaluation framework. All functions – from data organization to data viewing and report layouts – are tailored in detail to automotive safety testing. Extensive customizing options make it possible to implement individual project requirements.

Evaluation at the Push of a Button
The two evaluation systems help automotive manufacturers, suppliers and test laboratories around the world to meet increasingly complex safety requirements.
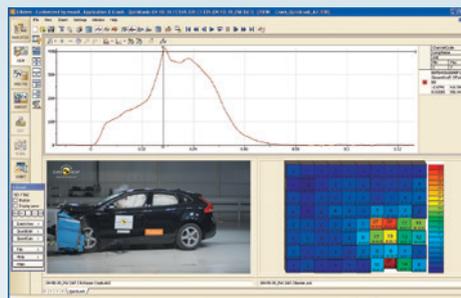
X-Crash specializes in crash tests and other tests for passive vehicle safety. X-Zero evaluates active safety functions such as driver assistance systems designed to prevent accidents.

At the heart of each program is a continuously growing evaluation library with internationally applicable test specifications and evaluation methods. This allows you to automatically generate standard-compliant evaluations. Alternatively, you can implement your own standards.

Approved Reference Software
X-Crash and X-Zero are the world's leading standards for the evaluation and documentation of vehicle safety tests. The software X-Crash is mandatory for the Euro NCAP (European New Car Assessment Programme) star rating of new vehicles.

With automated evaluations you speed up testing and validation.

*X*Crash *X*Zero

A Long-Term Partner for Your Success
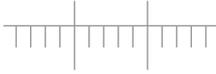
Long-term customer relationships are the best proof of our high competence in consulting and implementation. Whether you want a detailed system and requirements analysis, would like to be advised on the topic of data management or require an analysis system – our collaboration is based on trust and personal interaction in the interests of ensuring quality results. And naturally we remain by your side even after implementation.

Consulting and Drafting of Specifications

We advise you on all aspects of your test data management. At your request, we are happy to work out your requirements in the form of engineering specifications or a study. We specify your project requirements and develop a solution proposal that can serve as the basis for creating your invitation to tender documents.

Coaching

Encountering difficulties with your analysis work or have special questions about our software tools? We would be happy to send you a "personal trainer" to provide individual on-site assistance.

Service and Support

Our cooperation need not end with the successful system roll-out. We continue to support you and keep projects up to date, such as by adapting them to new technical requirements, changed standards or legislation. If you wish, we can set up a hotline for you to provide professional support.

Training

In addition to training in X-Frame and DIAdem, we can also provide instruction on customer-specific issues. If necessary, we focus on special topics, such as Visual Basic Script (VBS), object-oriented programming or the use of databases in the data management context.
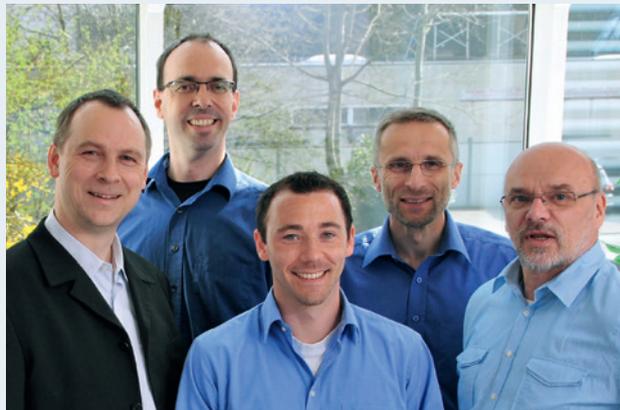
Profit from long-standing experience in test data management and a dedicated team of engineers and scientists.

x Member of the Vehicle Safety Measurement Data Processing Workgroup (MDVFS) and ASAM e.V.

x Partner of NI and Oracle

x Certified according to ISO 9001

measX
Measurement System Experts
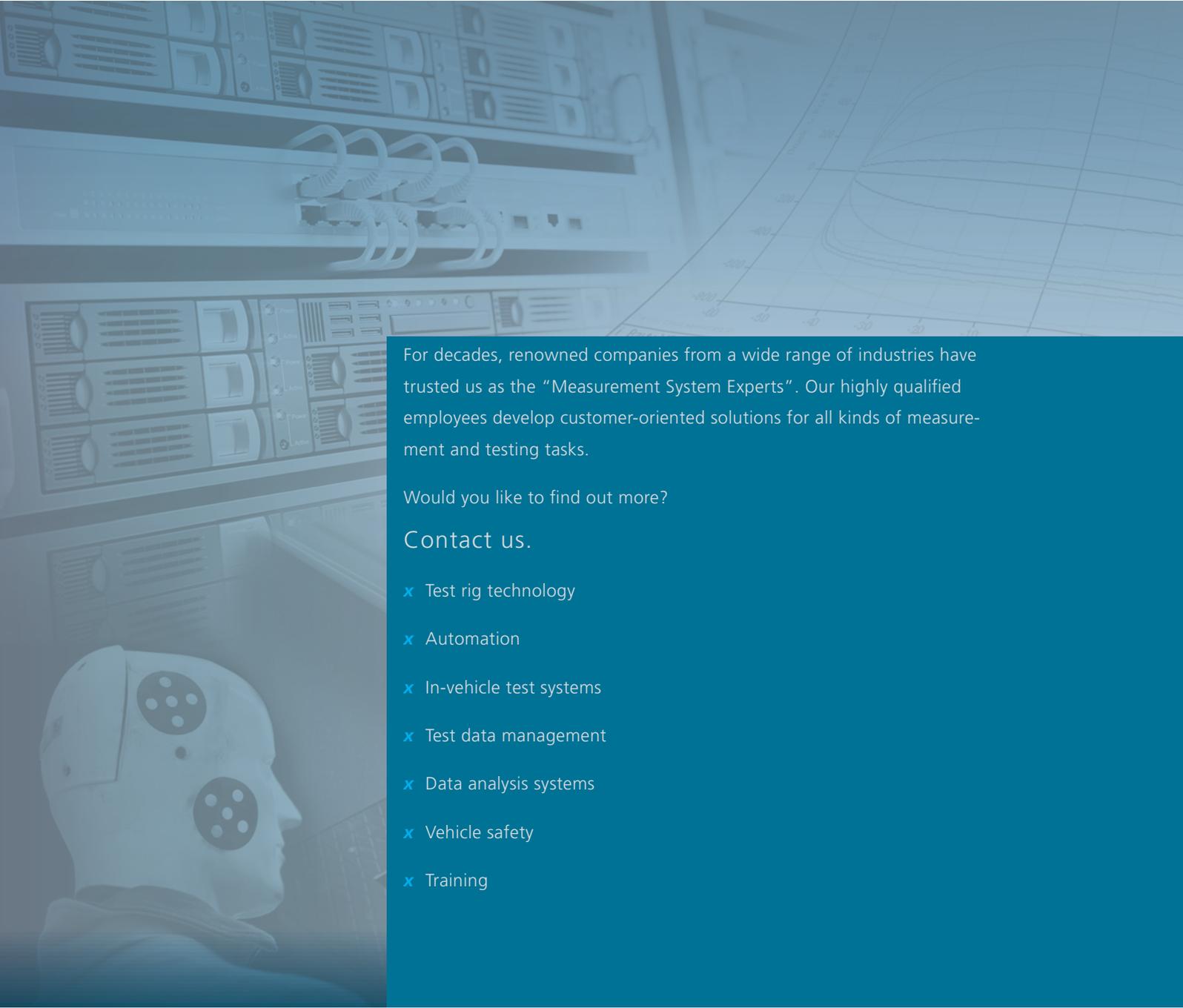
For decades, renowned companies from a wide range of industries have trusted us as the "Measurement System Experts". Our highly qualified employees develop customer-oriented solutions for all kinds of measurement and testing tasks.

Would you like to find out more?

Contact us.

x Test rig technology

x Automation

x In-vehicle test systems

x Test data management

x Data analysis systems

x Vehicle safety

x Training