

Next generation of data-oriented test benches

Testing Solutions at EUTech Scientific Engineering GmbH

- Data acquisition
- Data management
- Data engineering & analysis



Company Profile



Founded in 1999 (1995)

Located in Aachen, Germany

1000+ executed engineering projects

International teams of highly qualified engineers and software developers

Global customer base from various industries

Worldwide activities supported by regional engineering partners in Australia, USA, China, India, Europe, Brazil, Korea and Japan



Digital Solutions



Energy Solutions



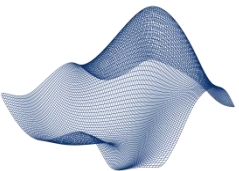
Testing



**Data Management and
Field Test Support**



**Turn-key
Test Stands**



Simulation & Control

Service

Some of our clients



Data-oriented testing

Motivation – Data-oriented testing solutions

New value propositions with digital solutions

Data Engineering

Test stand

Reference
Performance monitoring
State-of-Health

Digital Twin
Modeling



Testing as a Service

DUT

Data acquisition and management
Benchmarking

HiL Testing

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HiL Testing

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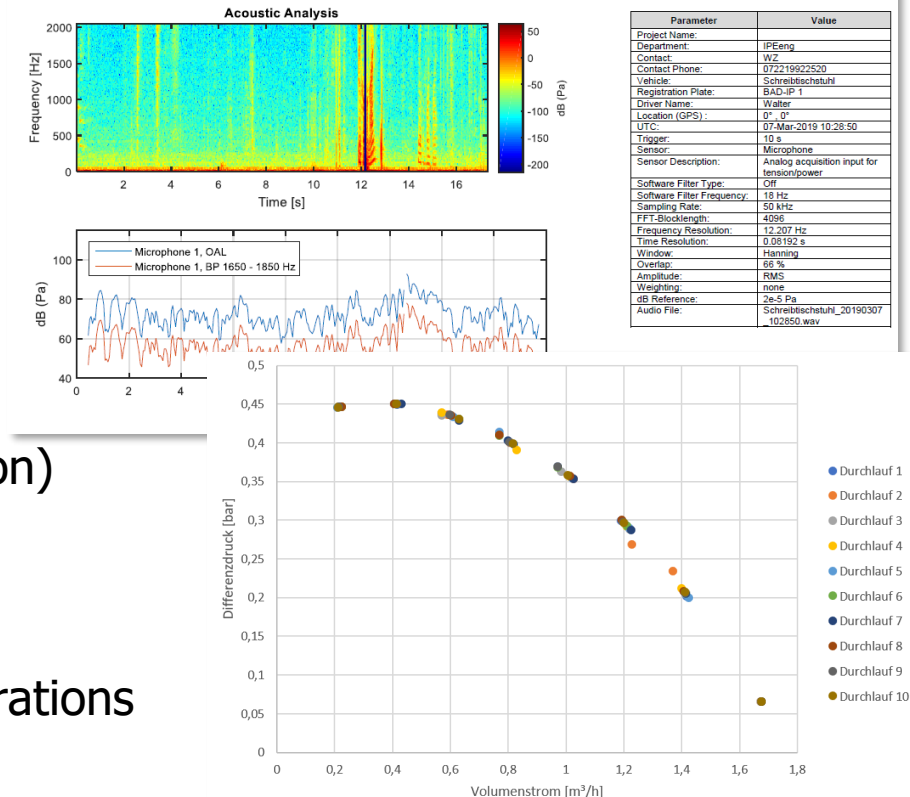
Data acquisition and management – DUT test / Reporting

Data management

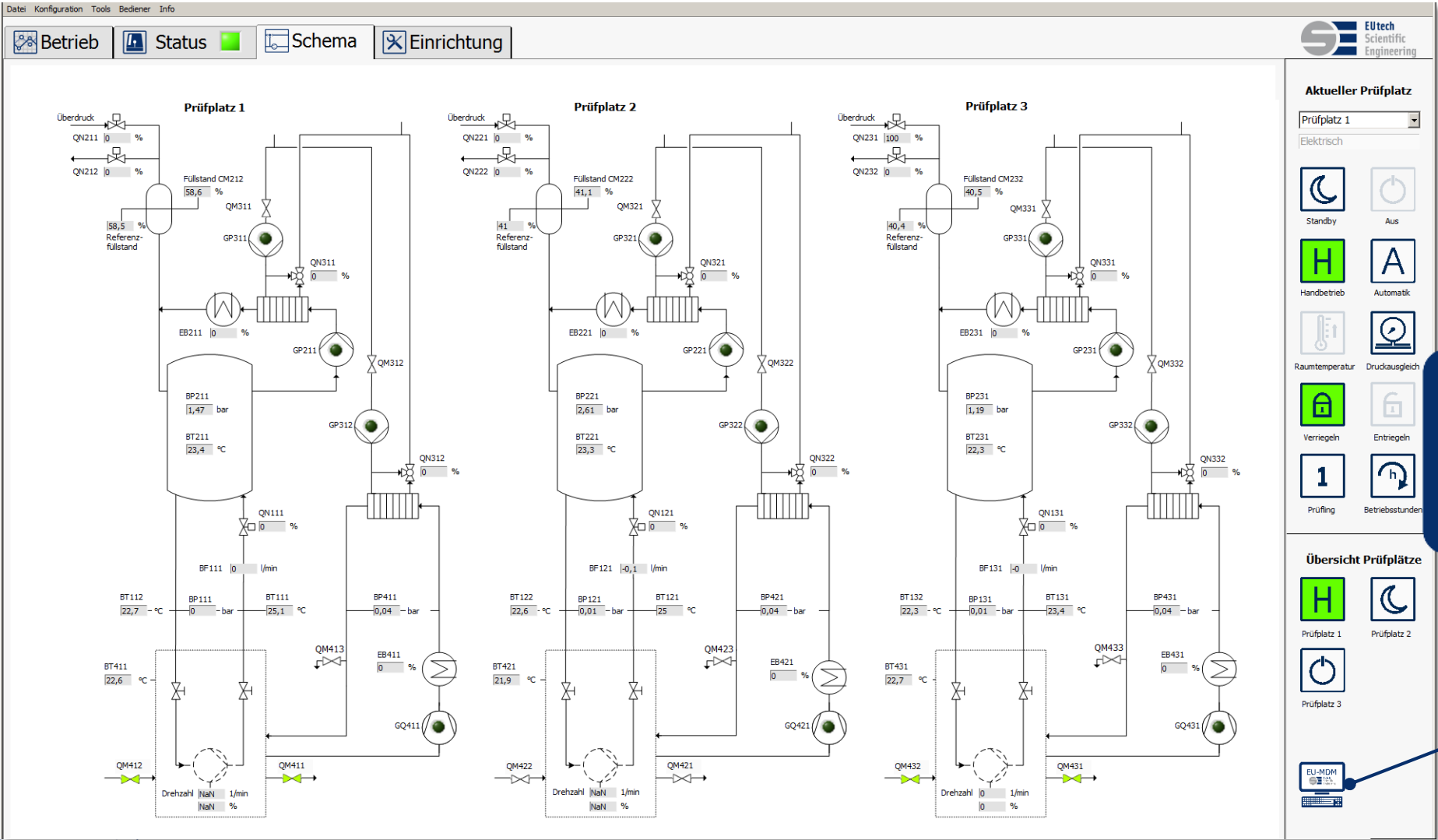
- Extensive information about DUT performance under test conditions
- Centralized and secured storage of large amount of data

Value added

- Pre-processing (Standard naming, plausibility tests, virtual signals)
- Integration of meta-data (firmware, product and test run information)
- Search and filter measurement, flexible and user defined
- Automated processing and reporting as well as flexible manual operations

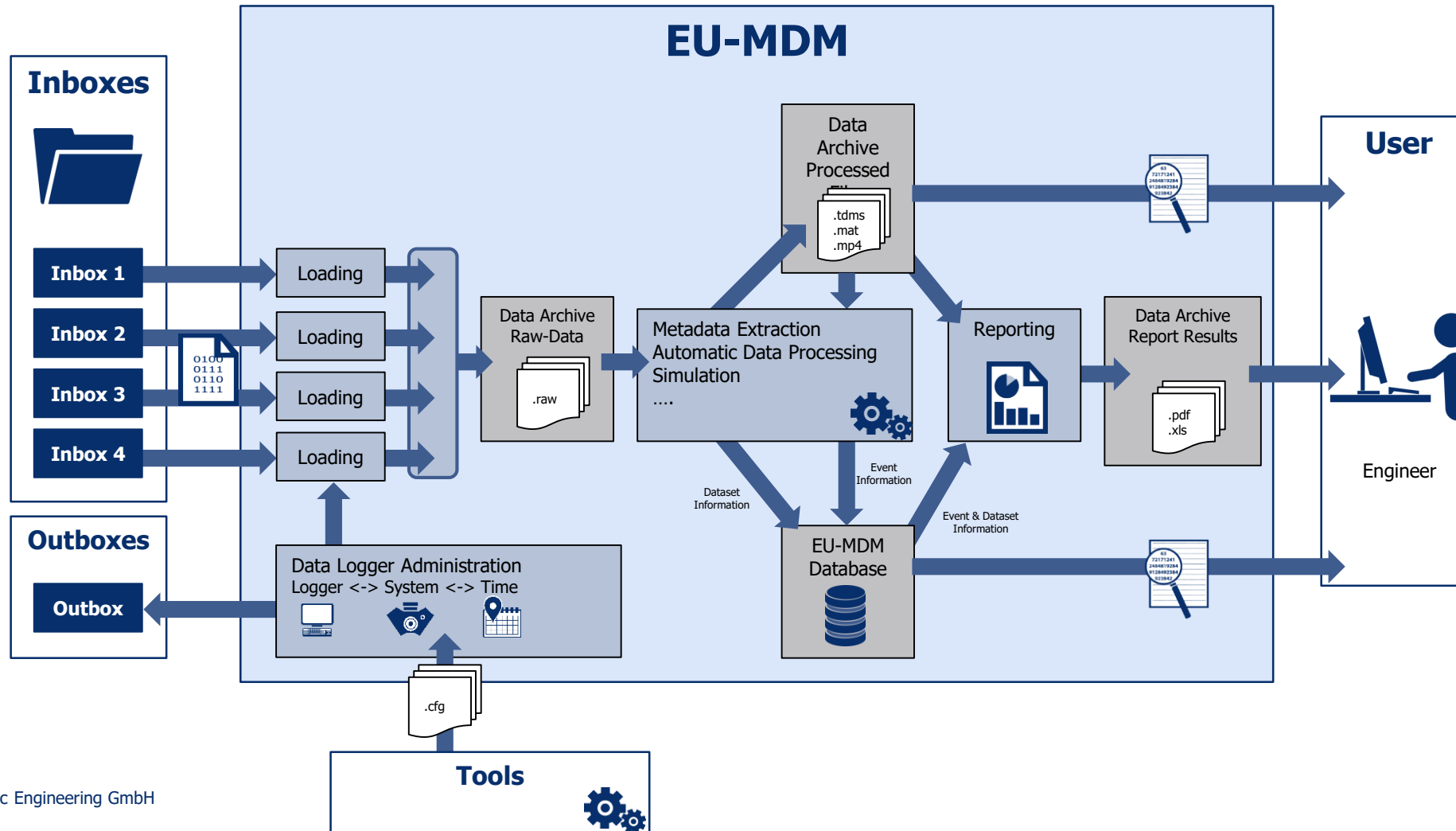


EU-MDM integrated part of test bench automation



Basic set-up and data flow

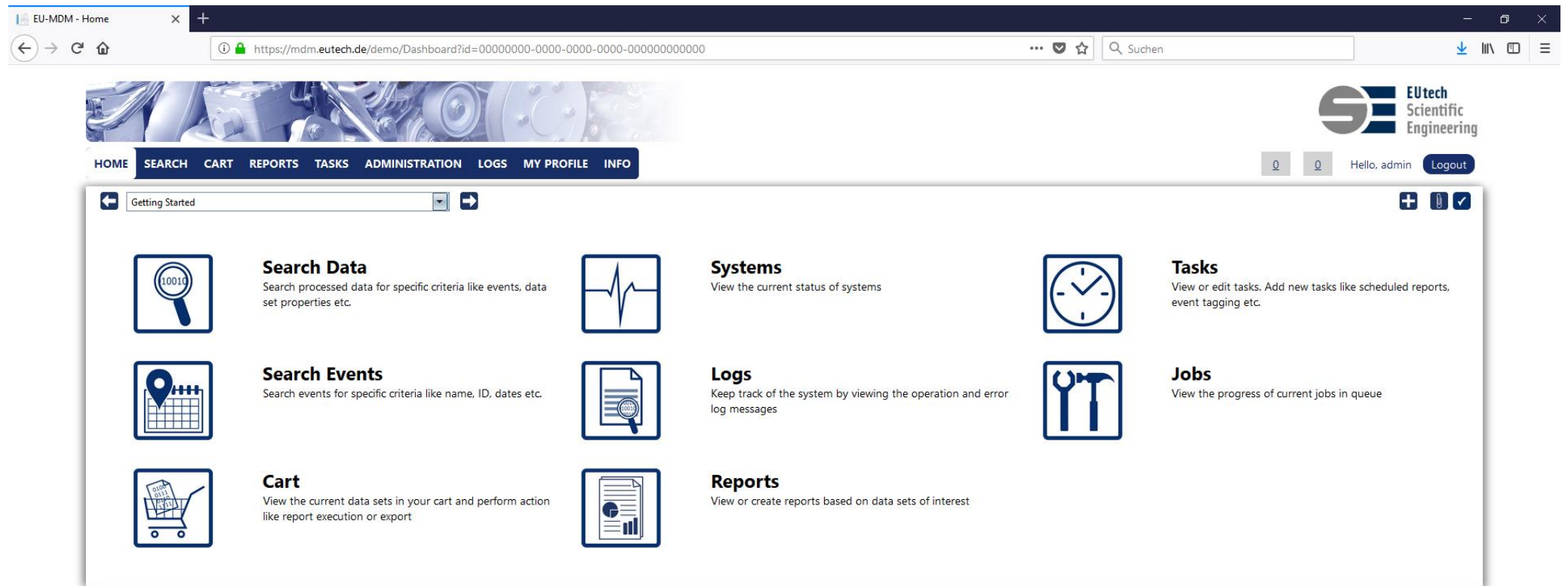
- Integral solution of our test benches



Data-oriented testing solutions

EU-MDM web-based frontend

- Web-based data handling and processing
- Worldwide accessibility and usage
- Easy search and processing



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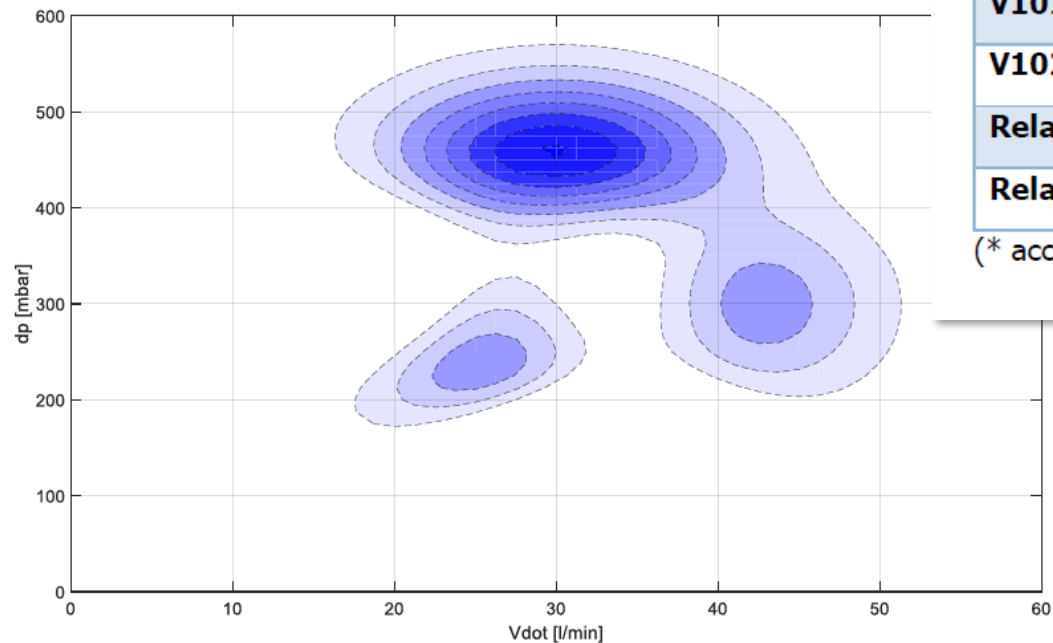
HiL Testing

Data-oriented testing solutions

Performance Monitoring of test bench

- Compact onboard diagnostic module
- State-of-health and key-performance parameters (KPI)
- Predictive maintenance
- Custom-tailored service packages

3.1 HYDRAULIC LOAD



3.3 COMPONENT LIFECYCLE MONITORING

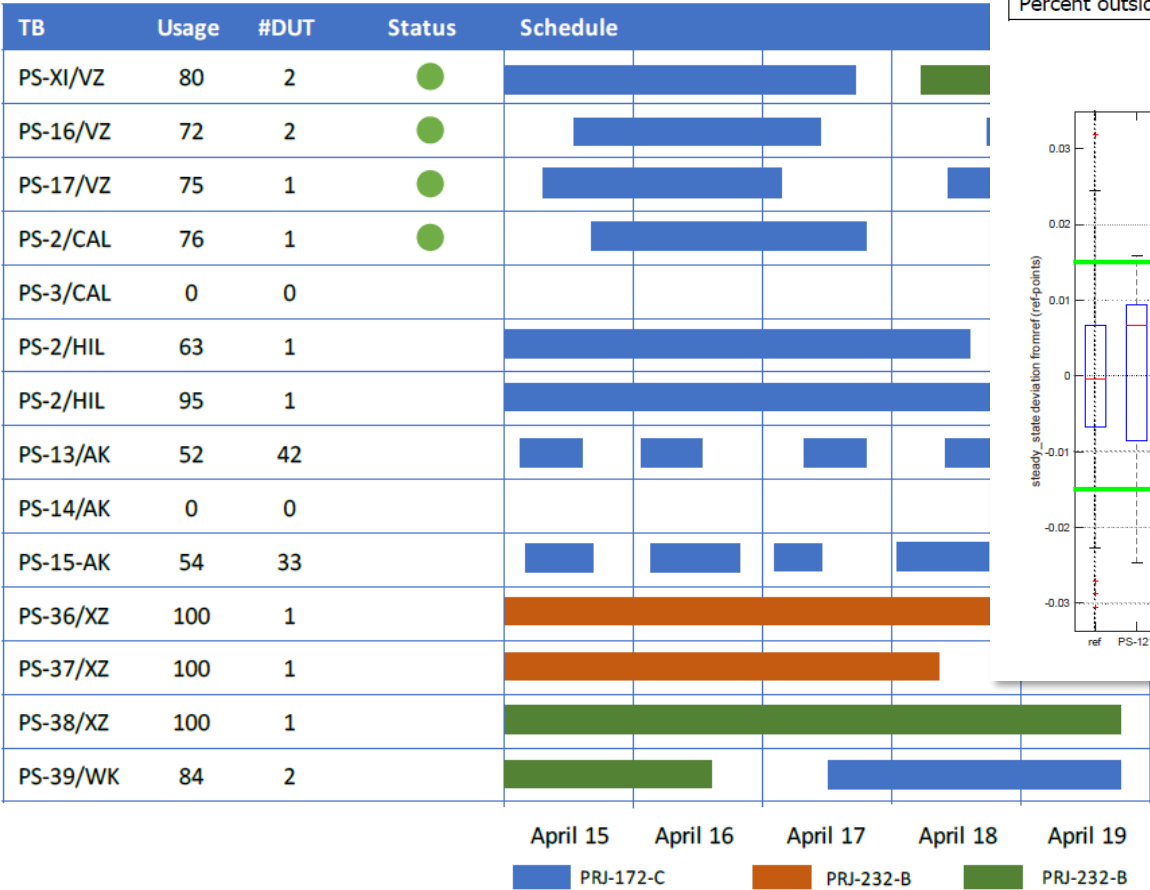
Switching Cycles (Valves & Relais)

Switching Component	Number of Cycles	MTBF	% of MTBF	Estimated Remaining Useful Life *
V101	546	5000	0,1 %	2 years
V102	67829	50.000	135 %	0
Relais X01	$0,9 * 10^6$	$1 * 10^6$	90 %	2 months
Relais X02	$1,1 * 10^6$	$1 * 10^6$	110 %	0

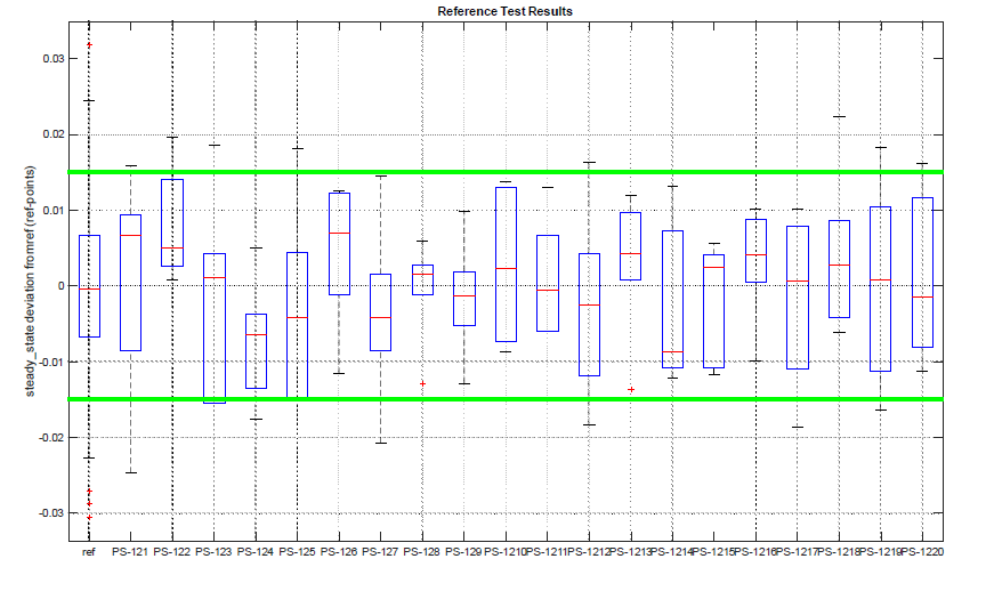
(* according to current usage profile within the last 3 months)

Performance Monitoring of test field

- Comparison of test bench field performance
- Referencing and Re-calibration



Time Range	2019-01-01 – 2019-03-31
Reference Point	0012
Number of measurements	14587
Number of invalid measurements (NaN)	1
Measurements outside limits	15
Percent outside limits	0,0205%



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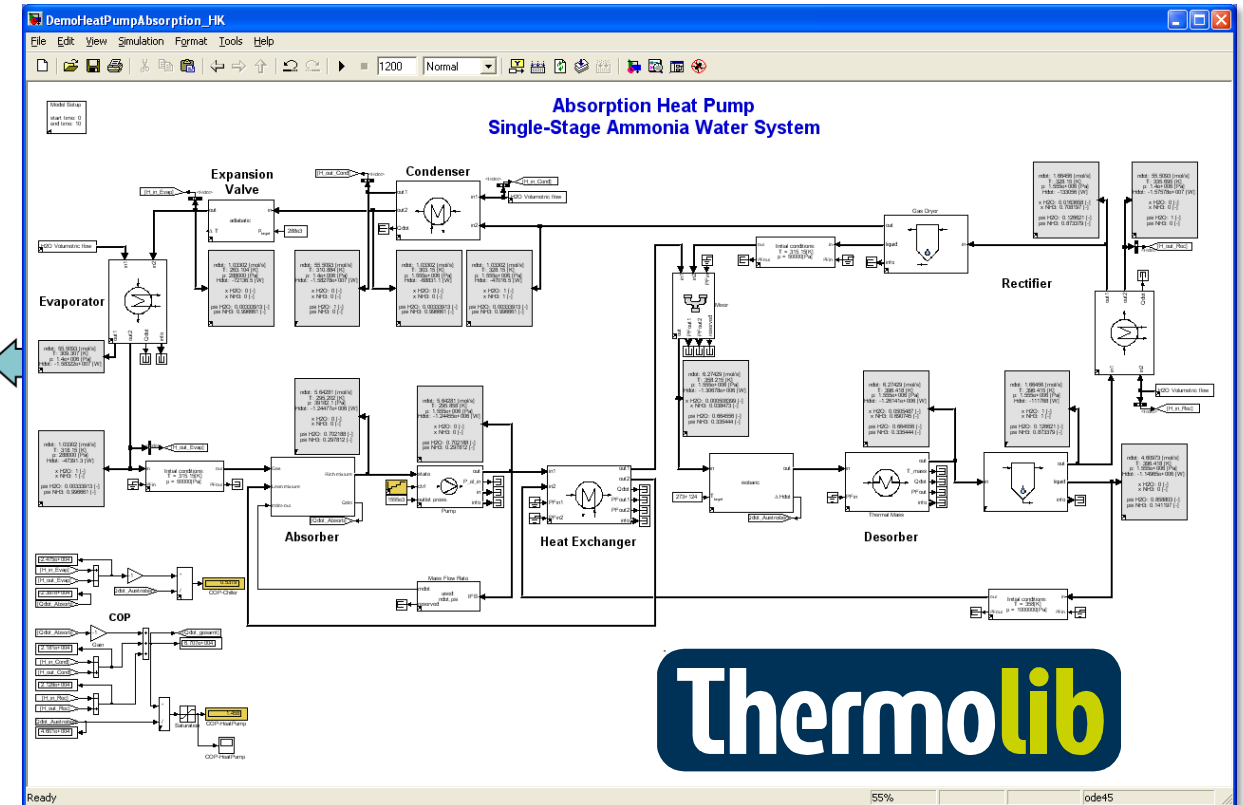
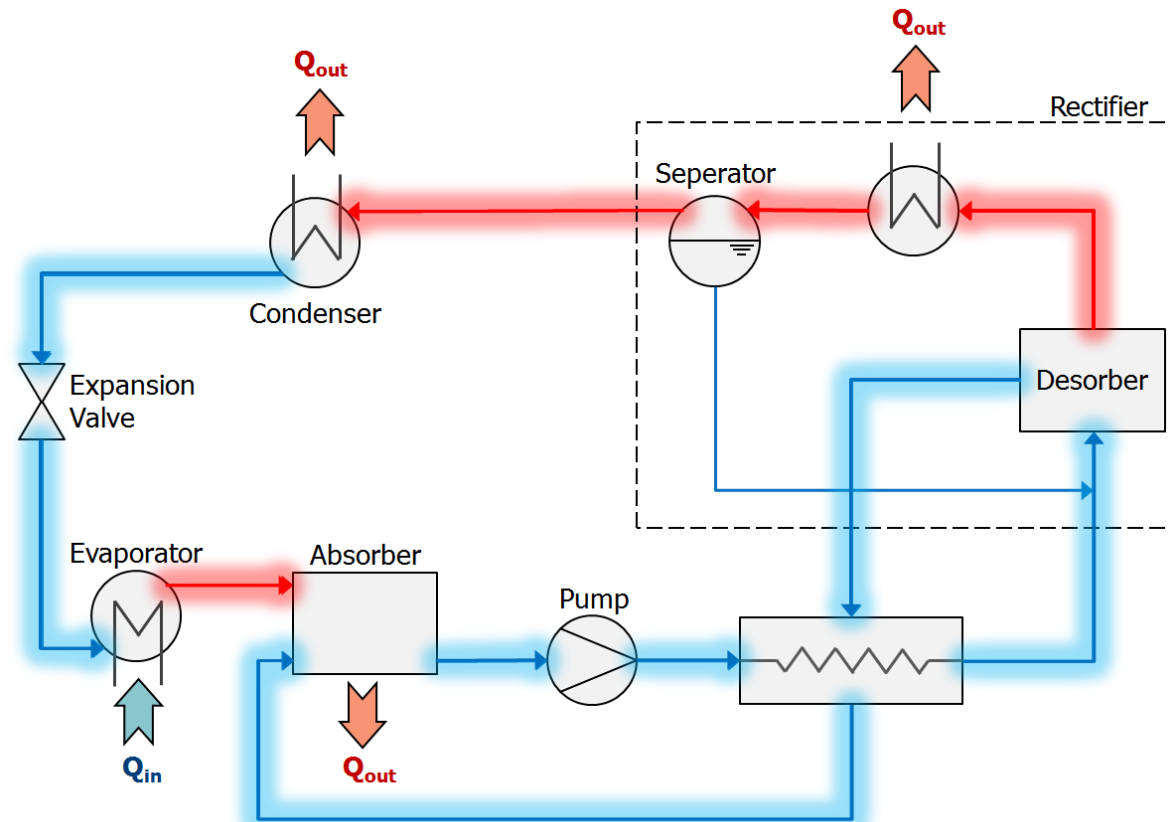
- Direct generation of realtime DUT model
- Cost efficient virtual test of DUT (Characteristics, change of working fluid etc.)
- Shorten development time and time-to-market



Data-oriented testing solutions

Digital twin – Test bench model

- Shortens development time (Test bench manufacturer)
- Identification of test bench degradation (Service/Maintenance team)
- Virtual test with real life data from field (Product developer)



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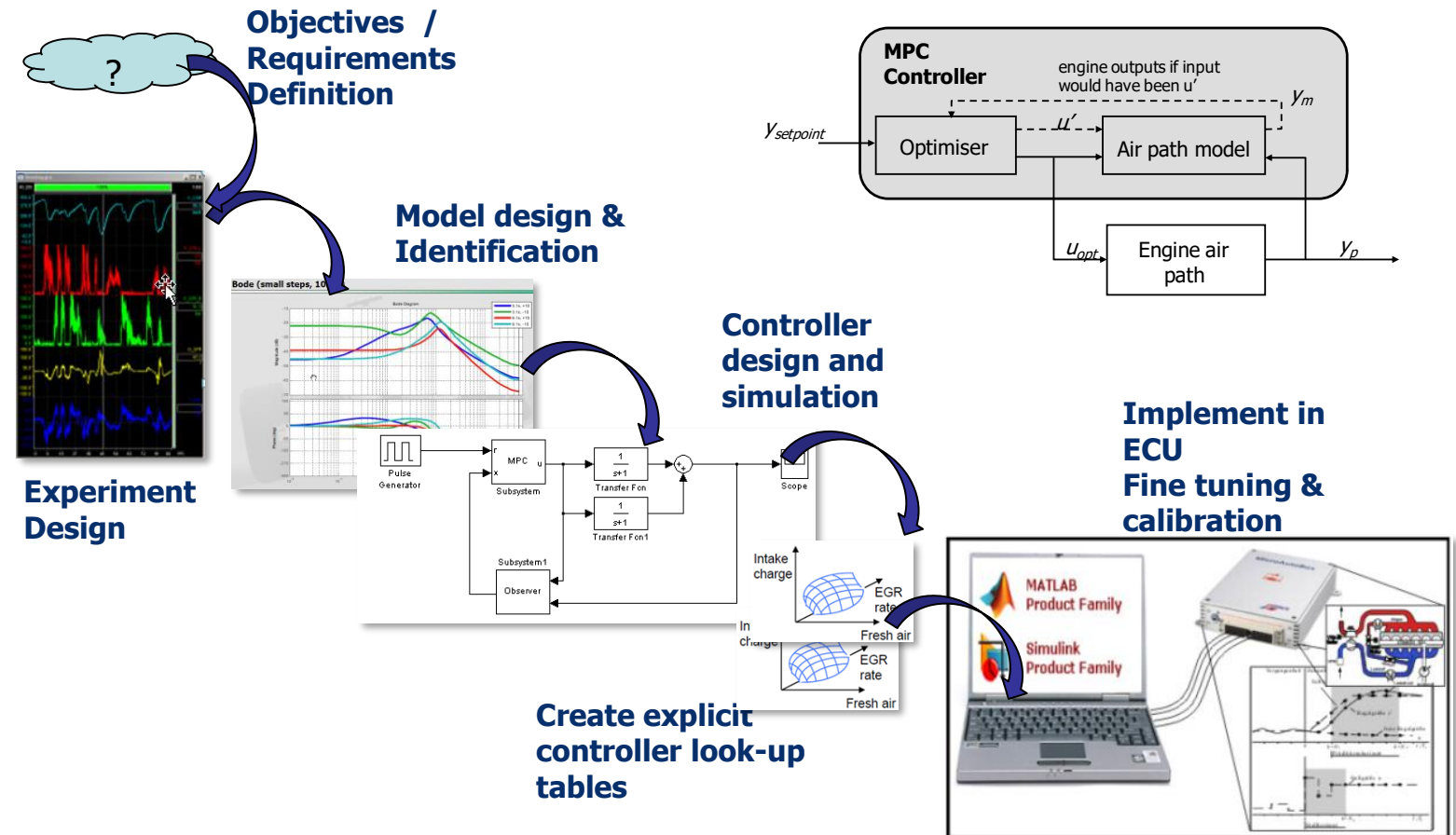
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Data-oriented testing solutions

HiL Testing

- Integration of DUT in plant model
- Measure once – simulate forever
- Extensive verification process using field data (Cost efficient testing)



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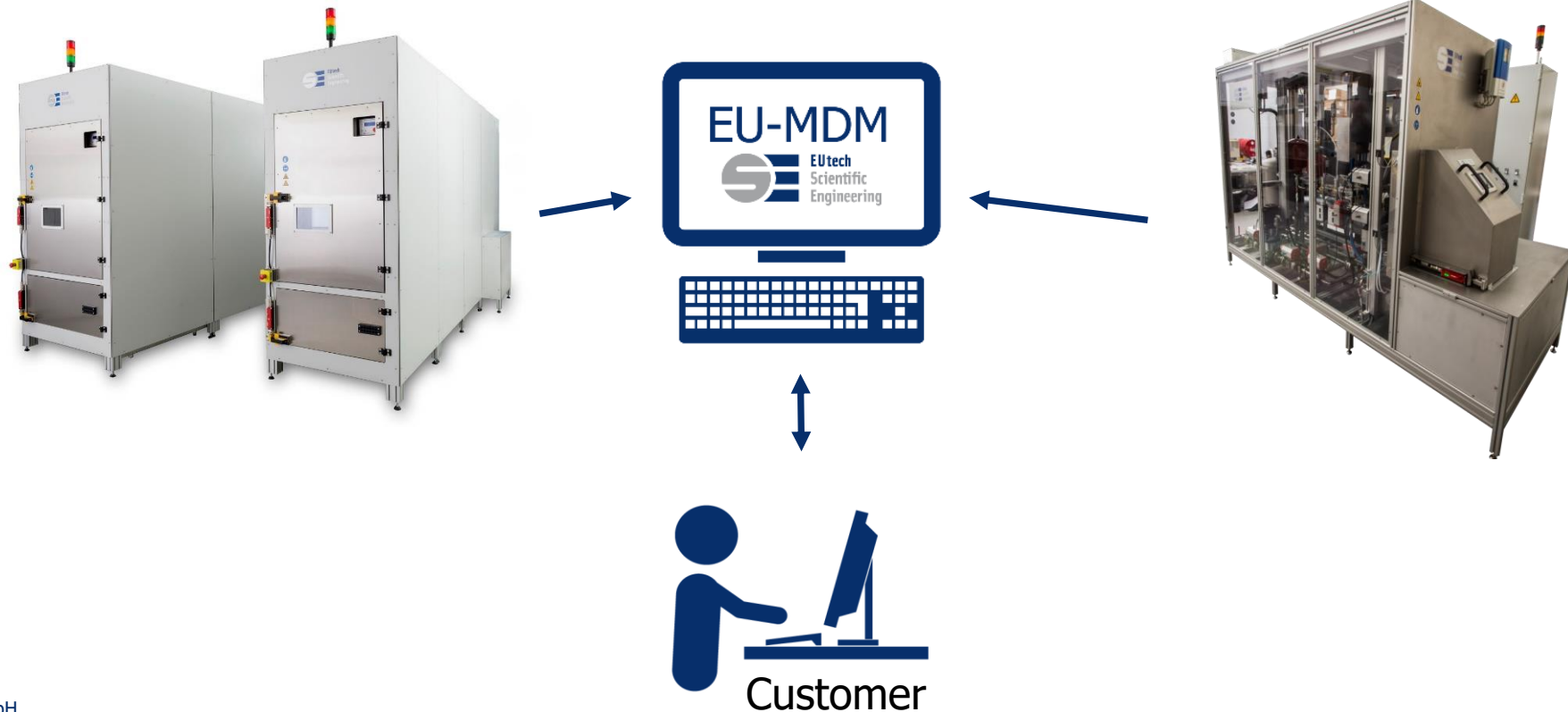
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Testing as Service

- Outsourced characterisation and evaluation (worldwide distributed resources)
- Pay by use
- Quick capacity increase
- Centralized and easy accessible data for users (inhouse and external)
- Transparent data availability for customer



Data-oriented testing solutions

Summary

- Digital data-oriented testing solutions offer new value proposition
- Taking it to a new level -> Save time, save costs of development and verification process
- Use data in various ways to extract maximum information for all participants from design to service throughout the lifetime of the product
- Discuss your application with us... IPETRONIK Booth

Thank you!
www.eutech-scientific.de