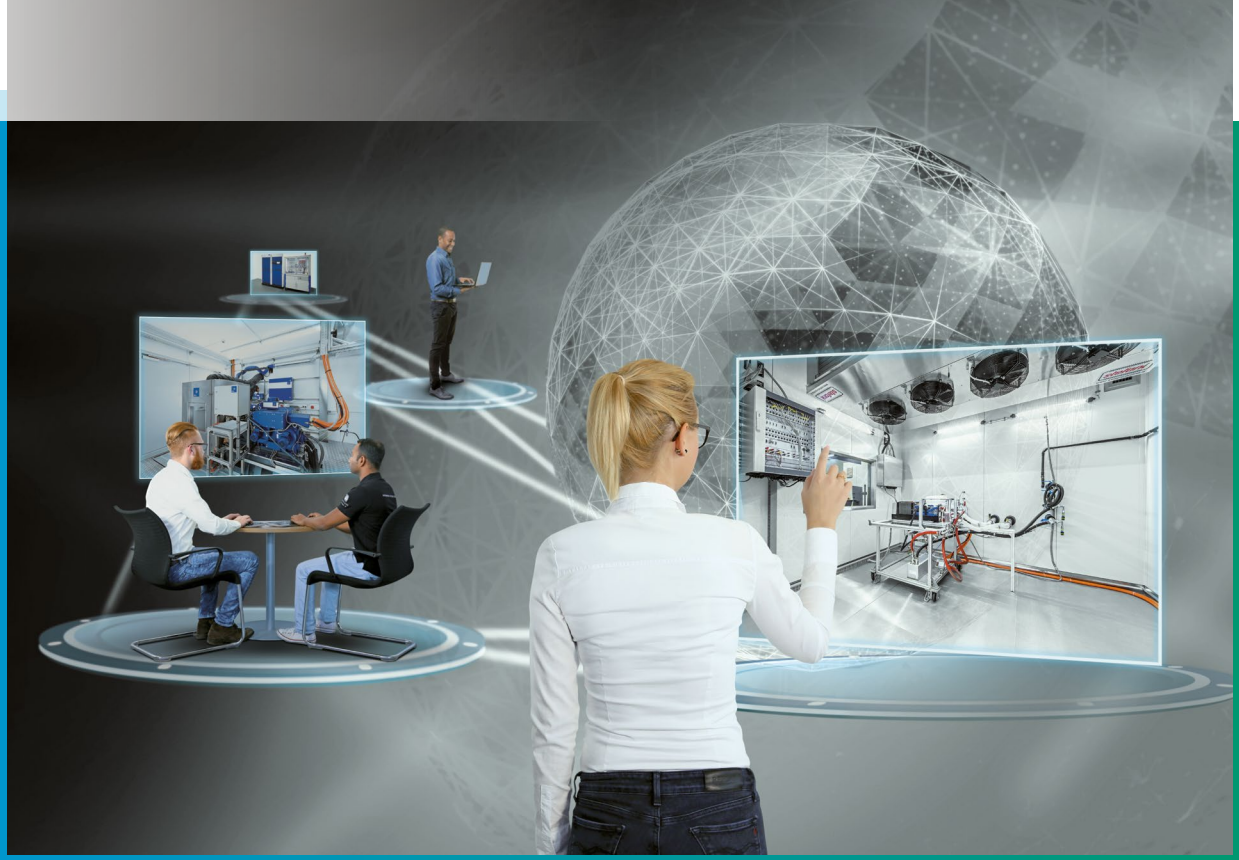


AVL PUMA 2™ Fuel Cell

The ease of automation

The intuitive automation system for high dynamic fuel cell system testing

THE CHALLENGE

Increasingly strict CO_2 restrictions worldwide and the demand for green mobility poses a huge challenge to the automotive industry.

Electric vehicles powered by hydrogen must ensure a long driving range and short refilling times. The continuous optimization of durability and reliability of fuel cell systems are key.

A state-of-the-art test environment must be able to combine the real fuel cell system on the testbed with a virtual vehicle to simulate real driving scenarios already in an early development phase.

THE SOLUTION

AVL PUMA 2™ Fuel Cell enables our customers to easily manage the challenges of present and future demands, from research and development to the validation of fuel cell systems.

An intuitive user interface allows easy access to modern testing and validation methods. In addition to standard features, such as steady state tests and fully automated test runs, it offers reliable and precise control of the unit under test, measuring devices, test cell facilities, and all safety-relevant monitoring features – in real-time.

With AVL PUMA 2™ Fuel Cell, our customers are prepared to easily execute complex test runs and centrally access and process data with integrated software solutions from the AVL Team SUITE™.



Unique combination of competences in fuel cell development between AVL HQ Graz and its Fuel Cell Technology R&D Center in Canada



AVL PUMA 2™ Fuel Cell: ready for fuel cell testing

THE ADDED VALUE

- Cutting-edge usability for new and experienced users – start testing within a minute!
- Easy definition of testing tasks thanks to graphical parameterization
- Reuse of test cycles due to flexible parametrization independent from unit under test and environment
- The global industry standard for testbed automation

HIGHLIGHTS

- Maximize the usage of testbeds by defining and executing a sequence of predefined tests
- Early online diagnosis of fuel cell degradation through integrated diagnosis controls
- Prepare and validate all testing tasks in the office to save valuable testbed time
- Real-time collection of data guarantees reliable and consistent measurement results
- Standardized device integration enabled by powerful and latest interface technologies

TECHNICAL DATA

Key facts	• Windows 11, Windows 10, INtime 7 and Oracle 19c • Deterministic real-time behavior up to 10 kHz • Up to 20,000 quantities to manage all types of user variables
Measurement types	• Continuous measurements with up to five recorders in parallel with 10,000 channels and 1 million samples/s • Steady state measurement with up to 5,000 channels, and automatic statistics calculation such as min/max and standard deviation
Monitoring	• Cell voltage monitoring control • Protection of the unit under test with multilevel safety monitoring with up to 1,000 limits and different reaction types • Post-mortem recorder automatically captures data in case of events
Interfaces	EtherCAT, CAN, CCP, XCP (via CAN or Ethernet), CAN FD, OPC, PROFIBUS, FDX, Modbus (Serial or Ethernet), UDP, PROFINET, AK, ASAP3, iLinkRT™, LIN (via gateway)
Standard software functions	• 'Check' function to validate parameters already in the office • Built-in tool to analyze testbed log files • AVL CONCERTO 5™ @ testbed for powerful data processing • 'Design mode' to easily change the user interface according to customer needs • AVL NAVIGATOR to administer testbed and test field in the office
Central data management*	• Centralized management of users, projects, and quantities • Guaranteed data availability in the entire test field • ASAM ODS compliant database based on Oracle • Testbed operation even in the case of complete network failure • Longterm archiving of result data
Measurement devices and sensors	• Supports AVL E-STORAGE BTE™, AVL HyTron™, various air and coolant conditioning devices, and more than 100 different measurement devices from many suppliers • DEVICE DRIVER STUDIO to develop own drivers • Various power control electronics supported • Hydrogen pressure sensor for accurate recording of highly dynamic pressure curves due to high speed data acquisition of up to 1,000 Hz

* requires AVL Test Field Server

FIND OUT MORE

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