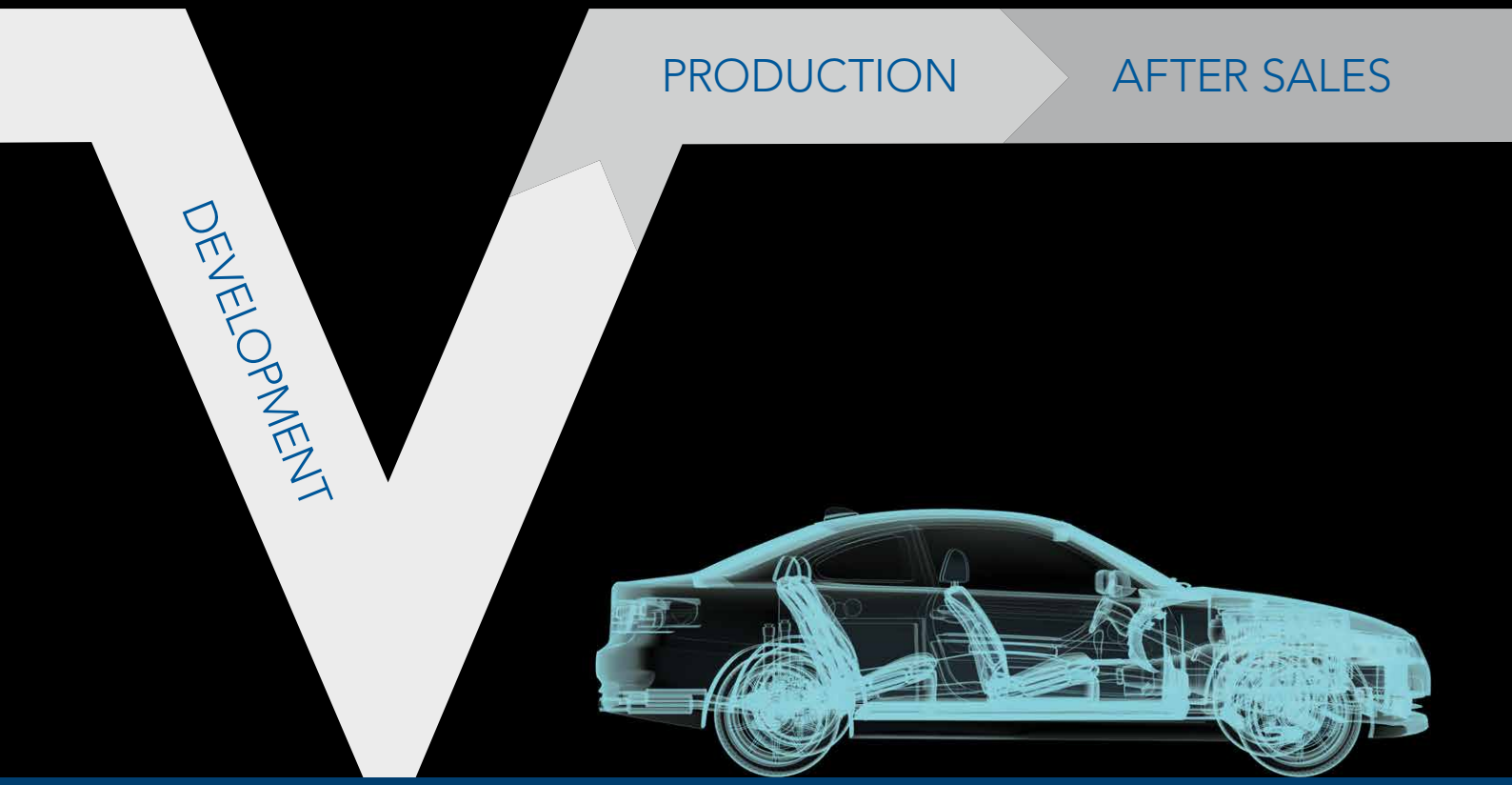
AVL DITEST

Vehicle Diagnostic Competence boosts your business.

OEM Partner for Diagnostic Solutions

AVL DiTEST
Software Solutions.



The AVL Group is the world's largest privately owned company of its industry. The corporate concept is the support of motor vehicles from the conceptual stages in research and development right up until the end of the life cycle.

Based on our long history in automotive diagnostic and our large product portfolio and services, AVL DiTEST has expertise and is a diagnostic system solution provider that allows adding unique value to our clients by combining consulting expertise, system integration knowhow with innovative development power. We offer expertise, products and services along the entire diagnostic process chain from the vehicle diagnostic design stage up to complete hardware and software solutions for the diagnostic service tool, diagnostic data-authoring and -management. In particular, we count on our core competencies like the conceptual diagnostic design and authoring, the complete or modular diagnostic system development and different hardware solutions beginning from VCI hardware to complete workshop service tool packages. Our technology allows the usage as developed by AVL DiTEST and the implementation of modular or framework components to be adapted to the specific requirements and optimal tailored solution for our clients.

INTEGRATED DIAGNOSTIC PLATFORM

Life cycle diagnostic solutions

DEVELOPMENT

- New Concepts
- Consultancy
- Specification
- Data Development
- Authoring
- Integration
- Migration
- Test & Validation

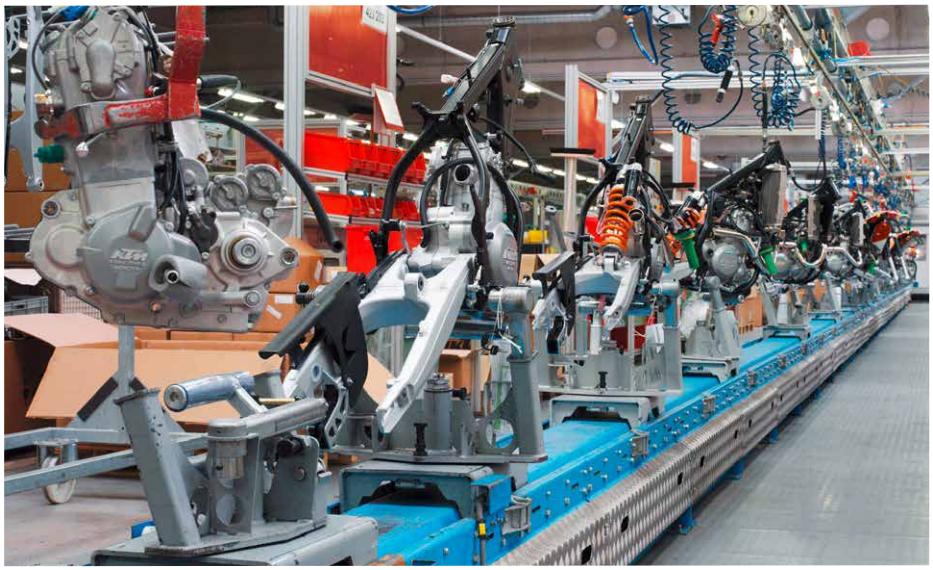
PRODUCTION

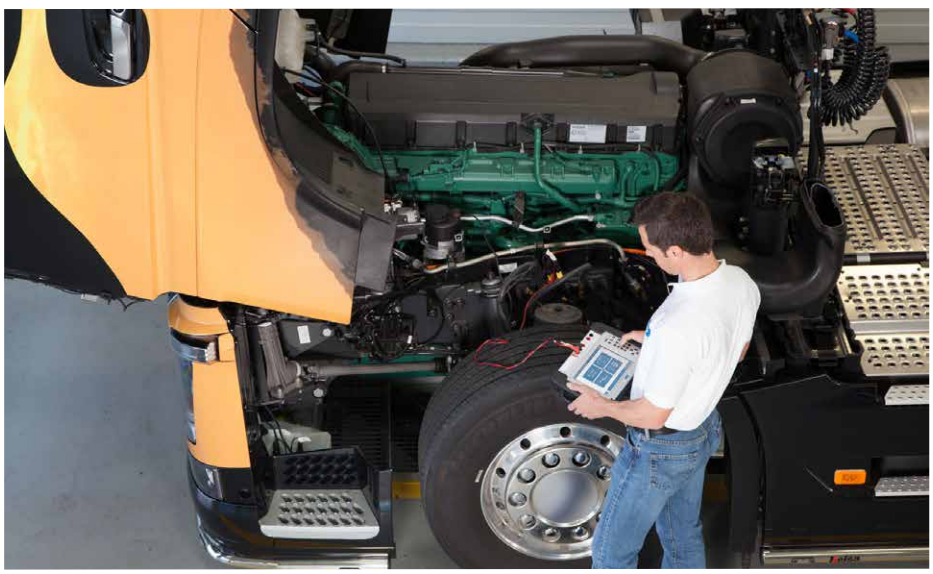
- Authoring
- Runtime Integration
- Test Validation
- ERP Integration
- Flashing
- Coding
- EOL Testing

AFTER SALES

- Authoring
- UX Development and consultancy
- Diagnostic Runtime
- Guided Diagnostic
- Technical information
- Embeded Diagnostics
- 3D/AR/VR Integration
- Semantic and ontology search engine

AVL DiTEST DIAGNOSTIC ECOSYSTEM



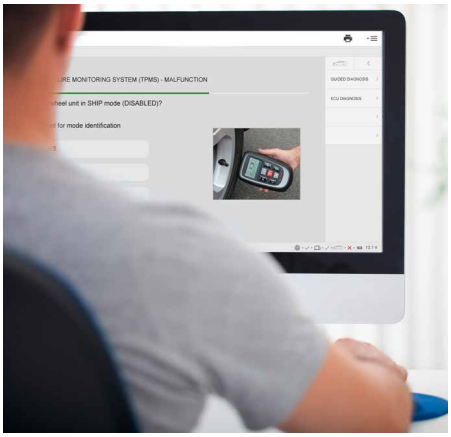


Development

AVL DiTEST assists customers from first concepts to the implementation of customized solutions. Our solutions help customers to master the new business challenges and increasing complexity and diversity of vehicle diagnostics. The permanent investments into our core knowledge and newest software technology consolidates our technological edge in:

Process Definition and Diagnostic Specification

Future vehicle networks and increasing connectivity require a general rethinking of vehicle diagnostic approaches, such as telematics or SOTA. AVL DiTEST assists customers with expertise in Off- and On-board diagnostics during specification and evaluation of diagnostic concepts. Our expertise includes diagnostic processes and workflow support, supplier management, development support and applications to ODX, OTX and AUTOSAR standards.



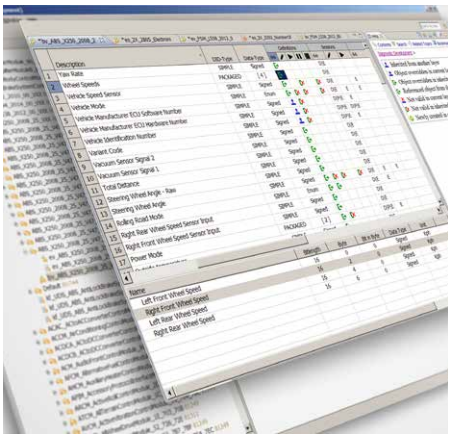
Diagnostic Data Authoring

AVL DiTEST next generation authoring tool chain AVALON offers comprehensive modules for creation, administration, development and execution of diagnostic data, test sequences and guided troubleshooting. The authored diagnostic data are seamless compiled into a speed and space optimized the diagnostic runtime for service bay tool application and/or EOL. AVL DiTEST AVALON main features are:

- ODX and OTX conform development
- Comprehensive and centralized vehicle ECU variant handling
- Different and customizable data views (textual, spread sheet, graphical)
- Automatic generation of optimized runtime code
- Multi-user support with central data version management
- Release management, rollout and staging support

Diagnostic Data Management

Vehicle diagnostic data is driven by a variety of standards, such as MCD-3D, D-PDU API, ODX and OTX, to simplify data exchange and guaranty better tool support. AVL DiTEST helps customers to develop individual diagnostic strategies, legacy data migration and company specific data creation guidelines. AVL DiTEST provides comprehensive support for the introduction of diagnostic sequences and technology for AUTOSAR ECU configuration and data exchange (e.g. DCM, DEM, DEXT).



Diagnostic Runtime

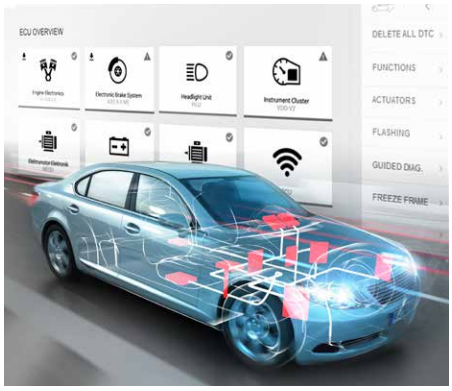
AVL DiTEST offers complete solutions for diagnostic runtime including UI development, symptom driven diagnostic and hardware solutions. AVL DiTEST runtime-optimized system guaranties a high performance ECU communication to reduce diagnostic and flashing times. The runtime system standard interfaces allow seamless integration of modern standards (MCD-3D, ODX, OTX), VCI hardware (ISO22900, SAEJ2534), third party systems (SOAP). AVL DiTEST runtime system main features are:

- ECU communication
- Simple and fast UI (HTML/CSS) with flexible workflow adaptation
- Seamless integration in AVL DiTEST AVALON authoring tool chain
- Support of all diagnostic functions, e.g. DTC's, freeze frames, live data, routines
- Integrated technical information and guided/symptom data
- Open interfaces to VCI and third party applications, e.g. warranty, spare part, DMS
- Role Management, Logging

Development

Diagnostic Data Testing & Validation
AVL DiTEST runtime system offers interfaces and support for automated diagnostic compliance testing and diagnostic data validation. The runtime allows to interface flexibly the testing VCI, automation controllers and HIL environments.

Rollout and Distribution
Our projects typically include customized rollout, distribution and training strategies for authoring, runtime and testing/validation environments. Software installations and updates distribution are integral parts of the build process and release management.



Production

Current and future vehicles are packed with latest technology, increasing functions and frequent changes, which permanently drive greater complexity into the plant. In the world of high velocity, vehicle manufacturers are challenged by the complexity to meet their performance and quality targets. AVL DiTEST supports vehicle manufacturers to master fast, efficient and high quality production processes based on our ground-breaking diagnostic solutions for the following fields:

Consultancy and Specification
AVL DiTEST offers competence, knowledge and experience to consult vehicle manufacturers in evaluation and definition of production testing tools and technologies, automated methodology concepts, test processes, cycles and test sequence specifications, data collection and analysis methods as well as production improvement measures.

Test Sequence Authoring
AVL DiTEST AVALON authoring tool chain allows for seamless creation and processing of test sequence authoring. The generated OTX/XML based test scripts support fully automated assembly and/or EOL tests with automation controller integration (e.g. HIL) and/or operator interacting tests.

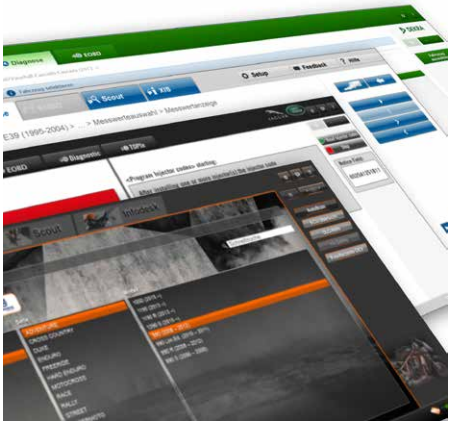
Testing Runtime Integration
AVL DiTEST diagnostic runtime supports flexible integration into testing automation controller. The application of common diagnostic repository and runtime for development, production and service bay tool enables automated validation and verification against engineering specification.

EOL Flashing and Coding
The AVL DiTEST diagnostic runtime supports flexible integration into EOL flashing and ECU coding and configuration stations together with special UX applications and ERP integration.

Test Analysis and Reporting
An additional analysis and reporting module allows the storage and management of all test results into a central database. The configurable analysis algorithms, queries and export functions enable sophisticated evaluation of test reports for issue identification and reporting.

DIAGNOSTIC SOFTWARE

After Sales



Diagnostics in after sales means performance in velocity, easy use and first time fix. The diagnostic tool needs to support and guide the user intuitively without need of training. This must be ensured under all conditions, independently of the user skill level or regional and cultural difference. AVL DiTEST is expert in the automotive domain by having deep knowledge about vehicles engineering and has the latest technology know how for implementation of the solution. With our comprehensive, integrated platform over the complete diagnostic process, it is possible to be quick and precise with highest possible diagnostic accuracy and feasibility of analytics.

Virtual Service Platform

- Authoring
- UX Development and Consulting
- Diagnostic Runtime
- Guided Diagnostic
- Technical information
- 3D/AR/VR Integration
- Semantic & Ontology Search Engine
- "ONGOING and FUTURE challenge"

Authoring – AVL DiTEST AVALON

The authoring for the diagnostic application must be as quick and simple as the application itself. Having one integrated platform from development until after sales with AVALON, gives rigid structure and repeatability. AVL DiTEST XDS AVALON provides optimum features for after sale diagnostic data management (e.g. creation of trouble shooting stategies).

Virtual Service Platform VSP

Within the VSP, all the cutting edge technology is fully integrated and linked in a semantic and ontology way. AVL DiTEST offers complete services and tools to generate the OEM specific SEMANTIC VEHICLE STRUCTURE MODEL up to implementing diagnostic flows and linkage of all relevant diagnostic information (e.g. service bulletin, technical information, field feedback, …). The integration of existing systems and consultancy, support and services for generating new systems, or trouble-shooting strategies are also expertise of AVL DiTEST. The core of the diagnostic application is the AVL DiTEST XDS RUNTIME, which is based on latest software architecture and assures highest performance, even at processing big data volume at ECU programming, at parallel- or IP-based communication. Thereby a minimal flash- and diagnosis-time effort can be achieved. For the user it is easy, smooth and seamless to get to the root cause of a problem and it´s solution reliable.

Ongoing and Future Challenge

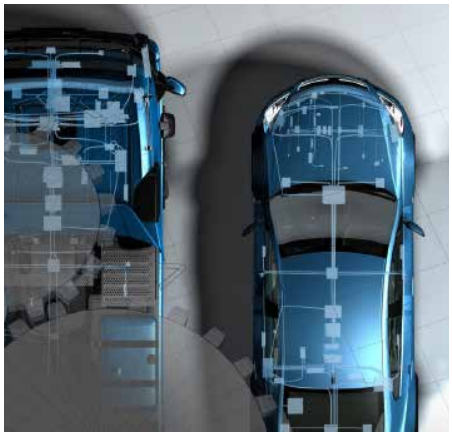
With AVL DiTEST the future trends are not only slogans, they become real: Challenges like Remote Diagnosis, Predictive Maintenance, and Diagnostics as a Service are accessible. We do complete feasibility studies for new challenges and accompanying the OEM on the journey to the objective.

Specific – Individual – Innovative – Outstanding

All our solutions are made out of a modular diagnostic ecosystem, which is entirely in AVL DiTEST´s hand to adopt specifically to the customer. We are very pleased to offer joint workshops to identify the current state of the systems in place and identify the demand for your world class diagnostic solution. AVL DiTEST is demonstrating taylor made ongoing support service for the software and hardware of the provided after sales tools, combined with an outstanding hotline for many OEMs globally.

Diagnostic Data Authoring

AVL DiTEST AVALON is a comprehensive diagnostic data development tool-chain. Main features of AVALON technology are the powerful data editor, the common data repository and the seamless runtime build. The modular and plugin based architecture allows easy adaptation, integration and extension of AVL DiTEST AVALON functionalities to various use cases and processes along the complete vehicle manufacturer development V-cycle.

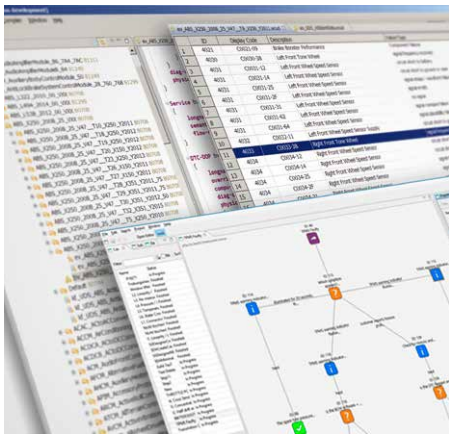


Creating, Editing, Importing, Exporting Diagnostic Data

The AVL DiTEST AVALON tool provides comprehensive means for diagnostic data handling, such as ECU data and functions, Variant Handling, Guided/ Symptom Diagnostic Data, ODX importer exporter, On-the-fly data verification, Diagnostic Flows, Manufacturing Test Sequences, OTX importer/exporter.

Common Repository

A single, shared, SVN based data repository for development, production and service guaranties short and efficient diagnostic data development cycles, one source of truth, increased product quality, less investments by efficient reuse of data and runtime across businesses and vehicle platforms.

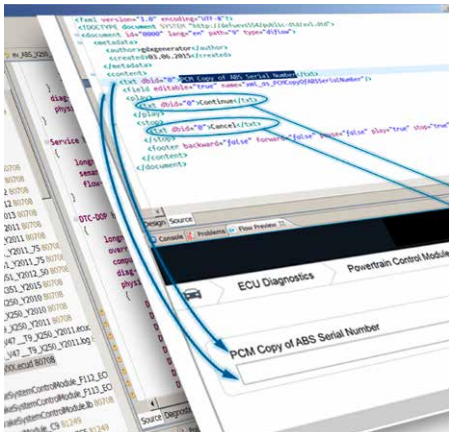


Configurable Data Views

AVALON provides different data views for sophisticated diagnostic data development in powerful Domain Specific Language (DSL) text editor or special table and graphical modes to assist during diagnostic data and function development. Runtime UX optimization is supported by WYSIWIG previewing during creation of diagnostic services.

Integrated Runtime Build

The integrated, one-click build process applies diagnostic data, sequences and UX components to production test or service tool runtime. The build process also supports release management, rollout and software distribution.

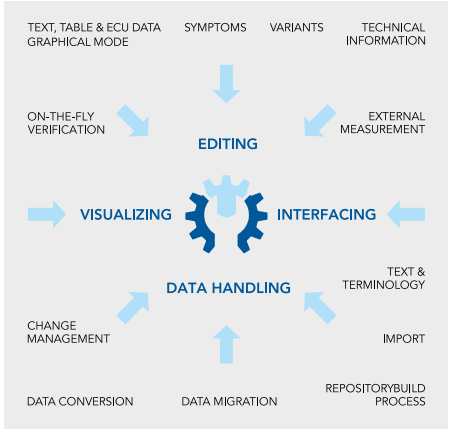


Comprehensive Interfaces

AVL DiTEST AVALON technology features wide range of interfaces to integrate different data sources, software or hardware components: Technical Information Integration, CSS/HTML UX interfaces, SOAP API, Standard ISO 22900/SAE J2534 VCI, Measurement Technology Interfacing, 3rd party workshop systems.

Seamless Experience

Different diagnostic data and functions can be created, managed and linked together to create seamless diagnostic experience, such as automated answering of guided diagnostic questions, automatic triggering of ECU functions during symptom diagnostic, VIN related execution of vehicle functions.



Integrated Legacy Data Migration Modules

Customized data importer help to migrate legacy data into specified standard formats.

Text and Terminology Management

The language translation workflows are supported by additional modules to handle text and terminologies during diagnostic data development.

AVL DiTEST
Hardware Solutions.

The hardware solutions complement the Diagnostic Software or actually enable the possibility of efficient vehicle diagnostics. Understanding the vehicle manufacturer´s needs and our passion paired with experience and global perspective allow us to create innovative solutions. Our success can only be measured regarding the success of our customers. AVL DiTEST equips many vehicle manufacturers in various branches with diagnostic hardware like Vehicle Communication Interface, diverse measurement technique such as oscilloscopes and specific solutions for challenging applications, also for High Voltage demand. The solutions are used in the fields of engineering, production – end of line tests-, and in many global After Sales organization of vehicle manufacturers.

Furthermore many specific solutions and standard AVL DiTEST products have vehicle manufacturer approvals and recommendations. To name just two examples: Emission testing equipment as well as OEM-approved A/C Service instruments (for the new coolants 1234yf and R744) are in the field operation for OEM´s service networks all over the world. Our basic philosophy is to provide convenient, quick, and self-explanatory tools for efficient diagnostics. To make and keep the diagnostic capability for our customers perfect, we provide tailor made warranty concepts for maintenance and service, even up to live time warranty and worldwide exchange service.

Modular Platform – MVCI 2000

AVL DiTEST offers hardware and software solutions in the field of automotive measurement systems and diagnostics technology for vehicle manufacturers and their service network. Central system components are developed and maintained on site at AVL DiTEST from the analysis phase till rollout. The key goal of the developed modular Vehicle Communication Interface (AVL DiTEST MVCI 2000) platform is the fast and flexible adaptation to different requirements of our customers and their field of applications.

The new AVL DiTEST MVCI 2000 platform for vehicle manufacturer is especially designed to meet the requirements in vehicle production and vehicle servicing, such as high data throughput, high level of platform stability, long-term availability of components, readiness for future upgrades (e.g. DoIP, WiFi AC, Telematic), cost reduction and reduced worldwide certification effort. The MVCI 2000 platform is offered as off-the-shelf product or customized version by adapting core components of main board, vehicle interfaces, workshop interfaces and the housing design. The modular MVCI 2000 platform incorporates:

- Service exchangeable modules design with mechanical and electrical protection
- Modular vehicle interfaces to flexibly adapt physics and protocols (e.g. DoIP, UDS, CAN, K-Line, multiplexer)
- Modular workshop interfaces (e.g. USB, Gbit LAN, BT, Gbit WiFi, 3/4G)
- Standard VCI communication interfaces (ISO22900, SAE J2534)
- Modular HMI to connect flexibly displays, leds and buttons to the VCI
- Upgradable memory and CPU performance (e.g. industry standard ARM with 2000DMIPS)
- High performance modular software stack based on modern embedded Linux Kernel
- Powerful SDK to implement customized functionality
- Highly reliable dual boot firmware design
- Comprehensive self-diagnosis capability
- UID & hardware base copy and misuse protection
- Connections for RTC and A/D converter
- Low level logging and debugging functions

The AVL DiTEST MVCI 2000 platform supports all required common and manufacturer specific interfaces and protocols, for example:

- D-PDU API ISO 22900-2 interface
- SAE J2534 Interface
- RP1210 A/B/C interface
- DoIP (ISO13400)
- CAN ISO TP (ISO 15765-2) and physical layer (ISO11898)
- UDS (ISO 14229) on CAN (ISO15765-3)
- KWP2000 (ISO 14230-3/SAE J2190) on CAN (ISO 15765-2) and K-Line (ISO 14230-2)
- Agriculture ISOBUS (ISO11783) on CAN (SAE J1939)
- OBD (ISO15031/SAE J1978/SAE J1979) on CAN (ISO 15765-4) and K-Line (ISO 9141/ISO 14230-4)

Modular Platform

OEM solution

OEM concept

VCI KTM

Precise results in record time

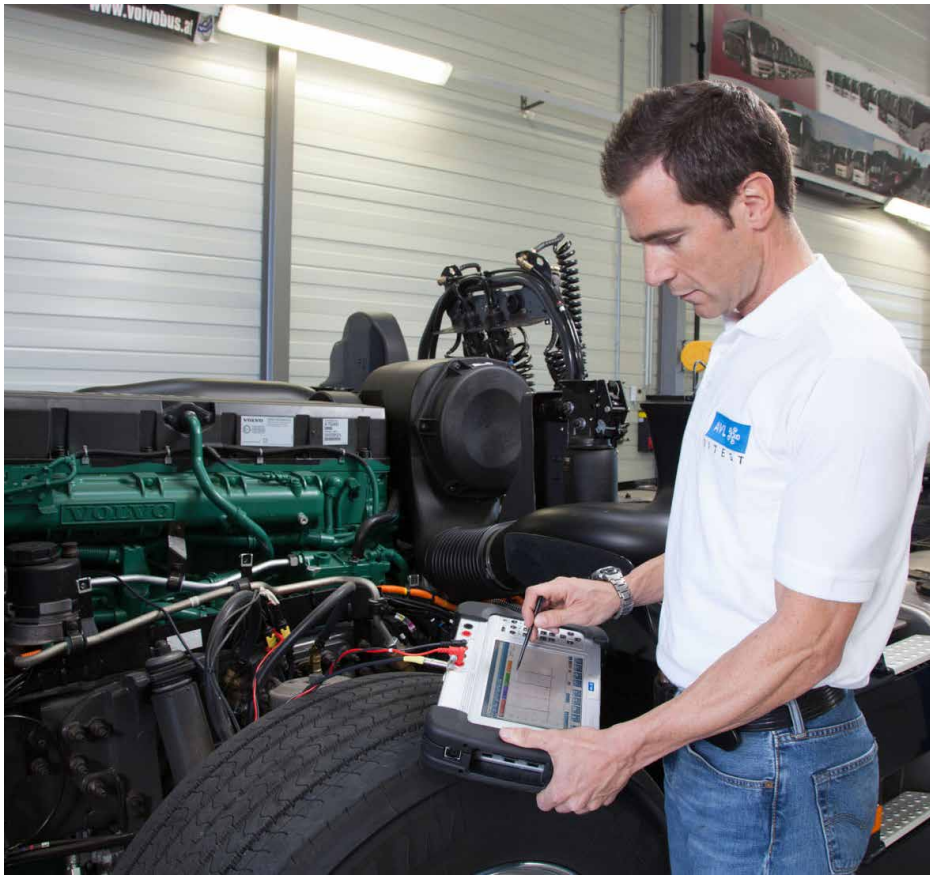
IMIB R2 BMW

Porsche PIWIS

VAS 5143A

VAS 6356

HMS 990



AVL DiTEST SCOPE

With a long history of automotive measurement experience and an impressive list of OEM customers, AVL DiTEST has set a new standard with the latest oscilloscope product range. The intelligent automotive measurement systems enable fast and professional fault diagnostics, checking electronic components in order to identify the root cause of the fault. The intuitive and straightforward guided software makes the use of the device very efficient and successful. All channels are galvanic isolated to prevents short circuits and makes the handling save. Other main features are:

- Differential measurement channels
- Automatic sensor recognition
- Automatic zero calibration and demagnetisation (degaussing)
- Intuitive and self-explanatory UX with More than 400 pre-configured measurements
- Direct reference curve comparison

The off-the-shelf products SCOPE 1200, SCOPE 1400 and SCOPE 8400 are ready to go or the ideal basis for customized solutions. All devices easily can be integrated into an existing diagnostic system. The business case for OEMs is quite clear: the use of the SCOPE allows a "first time right" repair in the workshop and causes great customer satisfaction. With the seamless documentation it is possible to reduce warranty costs (only faulty parts are changed) and the efficiency reduces warranty labour time. In case of quality issues the precise field-feedback to RnD and QM enables a short response time and a quick solution.

Come over to the safe side

HV SAFETY 2000 JLR

JLR Module Conditioning System

JLR HV Breakout-Box

JLR DCIR-Probe

AVL DiTEST HV SAFETY 2000

Especially developed for the e-mobility industry, AVL DiTEST HV Safety 2000 – the high-voltage measurement module – is an "all in one" device, able to perform measurements on the DC high-volt systems of electric- and hybrid vehicles and has a long list of OEM references. It guarantees the verification of all safety requirements for DC-HV circuits in the vehicle. The USB-port powered device supports all required measurements and automatically runs a continuous documentation. To fulfill regulations like UNECE R100 or ISO 6469 it has features like equipotential bonding measurement with 1 ampere, active insulation resistance measurement, and high voltage measurement up to 1000 V DC and can be fully integrated in the diagnostic system.

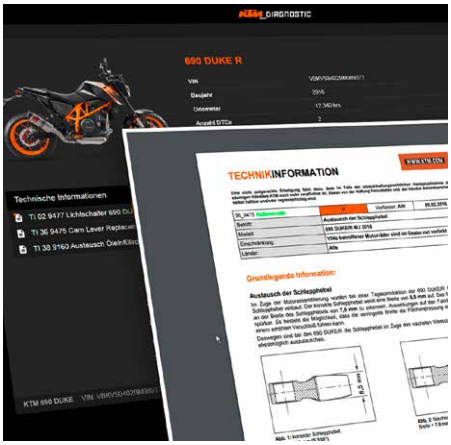
AVL DITEST MCS 120 – MODULE CONDITIONING SYSTEM

For charging and discharging battery modules:

- Replacing modules within a battery
- Adjusting the state of charge of new modules
- Module condition testing
- Individual cell monitoring and balancing
- High level of safety
- Voltage class B1, 75V
- Charge up to 80A

IMPLEMENTATION REFERENCE

KTM



AVL DiTEST is the strategic partner for the KTM Group in all matters of After Sales diagnostic, production and assembly as well as end of line testing since 2008. Furthermore, our software products are used in the development department at KTM. With the diagnostic solution KTM XC_1 NG, AVL DiTEST is the complete solution and service provider including software, tablet and VCI. This solution is currently used worldwide in approximately 2500 KTM workshops. The AVALON technology is an easy and fast way to implement upcoming ECUs and bike functions like TPMS, NGP learning or transport lock. In KTM production the AVL DiTEST software for flashing, coding and EOL testing is used and fully integrated in their ERP-System. To guarantee in-time software or repair manual updates, the AVL DiTEST Connect technologie supports automatic incremental software distribution over the air. Software development based on SCRUM allows AVL DiTEST to react immediately on any customer request, new features and update planning.

Summarized functionalities:

- Includes all KTM, Husaberg and Husqvarna vehicles
- All ECU diagnostic functions, e.g. actuator tests, DTC read/delete
- Graphical display of measured values
- Ride Recorder
- 3D navigation for vehicle information and repair manuals
- Seamless integration of AVL DiTEST HV Safety 2000 for E-Bikes
- Integrated UX for diagnostic, repair manuals and vehicle information
- Flashing of ECUs for production and service tool
- ERP system integration to link bike production information "as build data"
- Tracking livetime vehicle software status "as is data"
- Modular and configurable EOL test sequences
- VIN based automatic vehicle selection
- Pay per use services with DMS integration

AVL AND AVL DiTEST

Moving Performances

The Corporate Philosophy of AVL .

A holistic view of the automotive world is essential for the development of a vehicle to perfection and to ensuring its flawless operation in daily use. Guided by this principle, AVL DiTEST accepts the challenge of equipping OEMs, workshops and test centers with high-tech diagnostic systems destined to set the standards of tomorrow. The result of these efforts is perfect performance based on individual service and revolutionary AVL technology. Expertise gained in our over fifty-year love affair with technology has allowed us to achieve unsurpassed precision.

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